THE OIL WEEKLY

ENGINEERING « NEWS » STATISTICS

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The OIL WEEKLY
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The Oil Man's Calendar

JULY 19-20	Interstate Oil Compact Commission, LaFonda Hotel, Santa Fe, N. M.
AUG. 1- 6	The Eastern United States Michigan Oil & Gas Exposition, Mt. Pleasant, Michigan.
SEPT. 4- 8	American Society of Mechanical Engineers, New York.
5	Oil Workers International Union, Hammond, Ind.
11-15	American Chemical Society, Boston, Mass.
13-15	National Petroleum Association, Atlantic City, N. J.
OCT. 4- 6	American Institute of Mining & Metallurgical Engineers, Petroleum Division, Galveston, Texas.
5- 7	Texas Mid-Continent Oil & Gas Association, Houston, Texas.
9-10	American Gas Association Annual Convention, New York.
16-20	National Safety Congress, Atlantic City, N. J.
18-20	Independent Petroleum Association of America, Fort Worth, Texas.
19-20	A. I. M. E. Petroleum Division, Los Angeles.
NOV. 13-17	American Petroleum Institute, Stevens Hotel, Chicago.
15-17	American Institute of Chemical Engineers, Providence, R. I.
DEC. 4- 7	American Society of Mechanical Engineers, Philadelphia.
APR. 11-12	American Petroleum Institute, Eastern District, Division of Production, Columbus, Ohio.

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This Week's Panorama

IN view of the unsatisfactory results in the first half of this year, despite record consumption of petroleum products, the oil industry's outlook for the second half of 1939 is clouded and uncertain.

Results Unsatisfactory In First Half of Year

The industry failed to profit satisfactorily from its record volumes of business in the first six months, because of low prices for products, due to excessive refinery runs and surplus inventories of gasoline and some other products. Conditions were particularly adverse in the initial quarter of the year, but they improved somewhat and prices stiffened in the second quarter, through benefit of exceptionally good demand.

Outlook for Latter Half Is Uncertain

Inasmuch as gasoline prices, wholesale and retail, have been advanced substantially in the past several months, while demand has continued to run at record levels, the industry is in position to show better earnings in the latter half of the year than in the first half.

However, it is not definitely assured tthat the present improved prices for products can be maintained, particularly in view of the fact that gasoline inventories are materially above economic requirements, following record-breaking runs of crude to refinery stills in May and June.

If refinery runs should be continued at excessive rates in coming months, resulting in seriously burdensome inventories, then product prices probably would weaken, and low product prices might pull down crude price postings.

However, reasonable curbing of refinery runs is promised, as relatively strict control of crude oil production for the rest of the summer is contemplated in the prorated states, which account for about 90 percent of all United States output, and as moderate crude production is conducive to economic refinery runs.

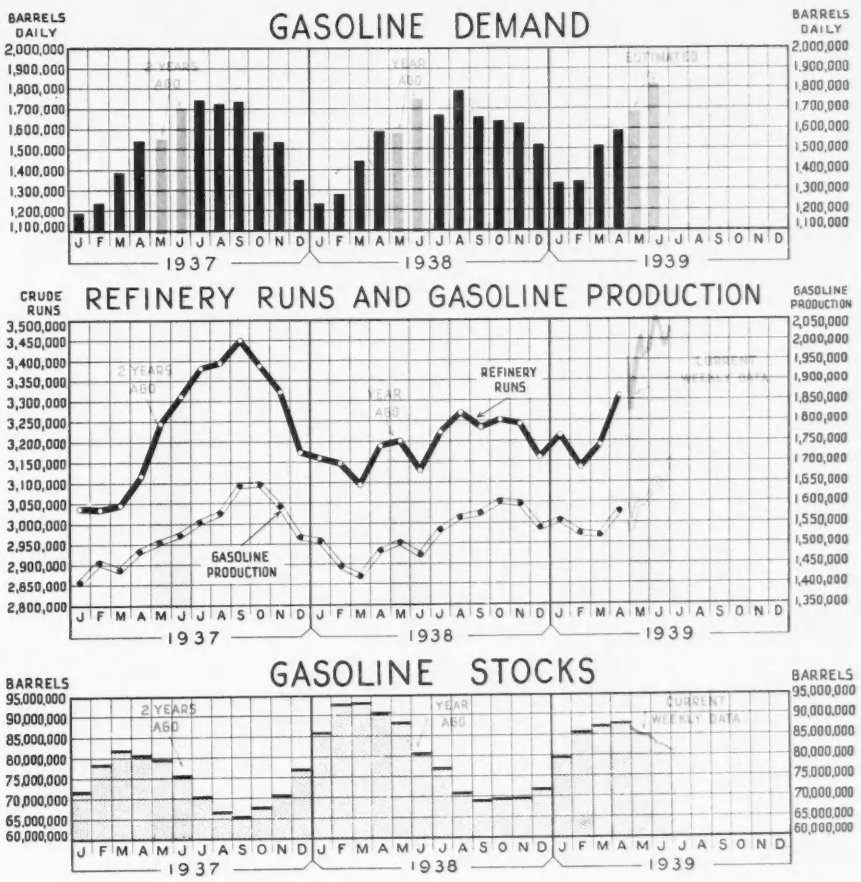
The Texas Railroad Commission has ordered continuance of Saturday and Sunday shutdowns of Texas fields through September, and Oklahoma conservation officials have indicated that production in that state will be reduced another 25,000 barrels daily in August, following a cut of that amount in actual output under the July order.

Seven prominent states accounting for nearly 90 percent of the national crude production, held output below indicated market demand in June and will continue to do so through July allowables. And similar strict control probably will be continued through the summer.

The national crude control situation, as a whole, is fairly satisfac-

Gasoline Stocks Cut Despite Large Production

Increased crude runs to stills result in larger output of gasoline in week ended July 1, but stocks are further reduced.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BARRELS DAILY
2 YEARS AGO
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REFINERY RUNS AND GASOLINE PRODUCTION
CRUDE RUNS
GASOLINE PRODUCTION
REFINERY RUNS
GASOLINE PRODUCTION
GASOLINE STOCKS
BARRELS
CURRENT WEEKLY DATA

tory, therefore, despite overproduction in Illinois, where there is no state proration.

Illinois Regarded as Temporary Problem

However, Illinois is regarded only as a temporary problem, as the state is expected to reach its daily production peak within a few months and then gradually decline.

It is predicted that production at Salem, the foremost Illinois field, will jump when the two new pipe line outlets now under construction are completed, and then drop.

Large production will last as long as the McClosky lime wells flow. After that, it may be that no more flowing wells will be completed at Salem. Most Bethel sand wells are pumping now. The Aux Vases sand is described as having a pretty name but sorry saturation.

Runs to Stills Are Large As Storage Oil Is Used

In the week ended July 1 the industry continued to maintain refinery operations at dangerously high levels. This was indicated by the latest weekly statistics of the American Petroleum Institute and the Bureau of Mines.

After having been cut down in the two preceding weeks, crude runs to stills were increased 50,000 barrels daily in the week of July 1, to a daily average of 3,480,000 barrels, which was within 30,000 barrels of the all-time peak of 3,510,000 barrels daily reached in the week ended June 10.

The increase in refinery runs resulted in a further expansion of gasoline production, to the largest weekly proportions on record, the output having totaled 11,921,000 barrels for the week ended July 1. That represented a daily average production of 1,703,000 barrels, or 39,000 barrels a day more than in the previous week.

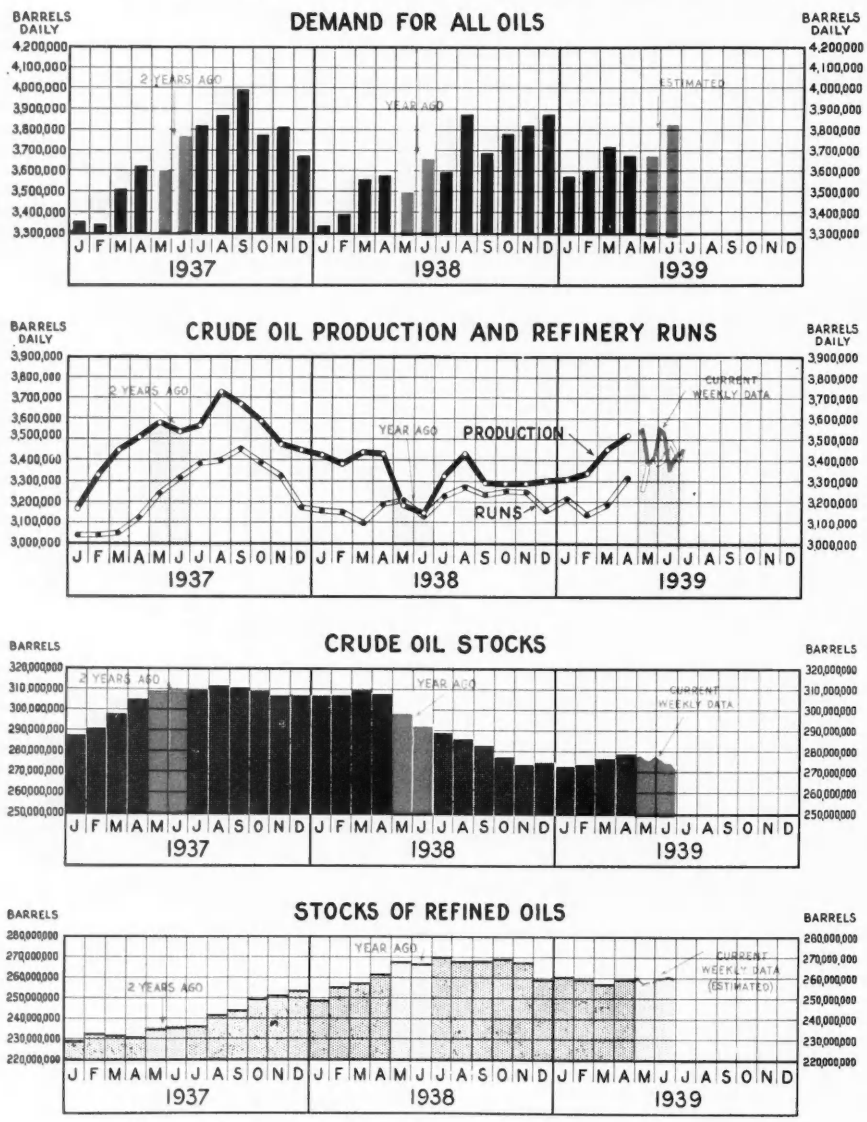
Despite the large output of gasoline at the plants, however, the markets absorbed all of it and also some from storage, as demand continued remarkably good. Total stocks of finished and unfinished gasoline were reduced 631,000 barrels within the week to the level of 81,102,000 barrels. That withdrawal was a little larger than the average weekly reduction of about 475,000 barrels since the beginning of spring, although it was less than the average of almost 900,000 barrels a week for the corresponding period last year.

At the new level of 81,102,000 barrels, the gasoline stocks were for the first time this year larger than at the corresponding time last year. The gasoline inventories proved seriously excessive in 1939, and in the earlier months of this year, the stocks were held substantially under last year's too-high levels. In May and June of this year, however, the curve representing the gasoline stocks steadily approached nearer to the 1938 curve, as inventories were reduced less sharply than last year. Finally, as just indicated, the flatter curve of 1939 crossed the more sharply declining curve of 1938 in the week ended July 1. As compared with the 81,102,000 barrels of gasoline on hand July 1, the storage amounted to 80,408,000 barrels on the comparable date last year.

The refining division of the industry has been responsible for the maintenance of refinery runs at higher than economically desirable levels in recent weeks. For current crude oil production has been within indicated market demand, under the comparatively strict prevailing allowables. And the large runs to stills have been possible only through the processing of some crude from storage in addition to that currently produced. From June 1 to June 24, withdrawals of crude from storage amounted to almost 6,000,000 barrels.

Crude from Storage Boosts Refinery Runs

Despite moderate output of wells, crude runs to stills continue high, and stocks of refined products remain large, as refiners augment raw material supplies by withdrawing crude from storage.



Asphalt Is Becoming More Important Product

By L. J. LOGAN, Associate Editor

ALTHOUGH asphalt is one of the minor products of the petroleum industry, accounting for only about 2 percent of the total demand for all oils, it is becoming relatively more important, as new uses are being found for it, while the older uses have been expanding.

In the face of a decline of about 1 percent in total demand for all oils in the United States in 1938, there was an increase of 8 percent in asphalt demand, domestic and foreign. (Domestic demand was up 9 percent, but the gain was offset to a slight extent by a decline in export demand.)

Although asphalt is used primarily for paving roads, highways and streets, and for roofing, it also is employed for numerous other purposes, such as waterproofing, blending with rubber, briquetting, coating pipes, in moulding compounds, and in paints.

Because of its shock-absorbing and water-repelling characteristics, asphalt is employed in construction of playgrounds, tennis courts, sidewalks.

A recently developed use is for the reinforcement of stone jetties along the seacoast, as in the instance where a 5-mile stone jetty protecting Galveston harbor was reinforced and made non-porous.

Along the Mississippi River, asphalt sheets are being used to reinforce levees and embankments.

Currently, special study is being given to the use of asphalt as a preservative, as the substance is immune to acid, alkali, and water, and is highly resistant to fire, while abrasion and impact have little effect on it.

Production Increased

In its recently issued annual report on asphalt, covering 1938, the Bureau of Mines showed that total asphalt demand, domestic and foreign, amounted to 4,607,345 short tons in 1938, compared with 4,258,060 tons in 1937, an increase of 349,285 tons, or 8 percent.

To meet the increased demand, petroleum refineries in the United States enlarged their output of asphalt 146,952 tons, from 4,359,924 tons in 1937 to 4,506,876 tons in 1938. Meanwhile, imports of lake asphalt, grahamite, and petroleum asphalt decreased 57,952 tons in 1938 from 1937. Consequently, stocks of asphalt at refineries were 67,038 tons lower at the end of 1938 than at the beginning, whereas inventories had been increased 193,247 tons in 1937.

Domestic Use Expands

The indicated domestic demand rose from 4,049,303 short tons in 1937 to 4,404,846 tons in 1938, an increase of 9 percent. For the first 3 months of 1938 the demand was 16 percent larger than in the corresponding months of 1937. In the second quarter the demand declined to about the same level as in 1937; in the third quarter it was 4 percent above the 1937 level; and in the final quarter the indicated demand was 26 percent larger than in the corresponding period of 1937. In terms of the long-time trend from 1908 to 1936, the demand increased from 17 percent above trend in 1937 to 23 percent above trend in 1938.

Exports Decline

In line with the declining trend since 1928, exports of petroleum asphalt were 3 percent smaller in 1938 than in 1937. Foreign sales of unmanufactured petroleum asphalt increased from 41,299 short tons valued at $657,894 in 1937 to 42,290 tons valued at $734,683 in 1938. But sales of manufactures of pe-

Asphalt and Asphaltic Material (Exclusive of Road Oil) Sold at Petroleum Refineries in the United States in 1938, by Varieties

(Value f.o.b. Refinery)

	FROM DOMESTIC PETROLEUM		FROM FOREIGN PETROLEUM		TOTAL	
	Short Tons	Value	Short Tons	Value	Short Tons	Value
Solid and semi-solid products of less than 200 penetration:						
Asphalt for:						
Paving	793,879	$6,615,133	477,959	$5,073,578	1,271,838	$11,688,711
Roofing	463,252	4,413,206	298,473	3,189,638	761,725	7,602,844
Waterproofing	14,870	167,745	47,651	520,208	62,521	687,953
Blending with rubber	6,394	69,536	17,420	226,484	23,814	296,020
Briquetting	56,822	597,832	919	13,416	57,741	611,248
Mastic and mastic cake	906	7,929	611	6,245	1,517	14,174
Pipe coatings	12,403	143,837	2,647	32,488	15,050	176,325
Moulding compounds	10,343	115,135	1,582	16,772	11,925	131,907
Miscellaneous uses	58,890	711,054	42,761	478,579	101,651	1,189,633
	1,417,759	12,841,407	890,023	9,557,408	2,307,782	22,398,815
Semi-solid and liquid products of more than 200 penetration:						
Flux for:						
Paving	121,796	839,365	71,908	658,370	193,704	1,497,735
Roofing	307,751	2,074,976	58,159	581,136	365,910	2,656,112
Waterproofing	3,239	42,810	6,190	55,710	9,429	98,520
Cut-back asphalts:						
Rapid-curing	538,390	5,194,927	354,520	3,934,335	892,910	9,129,262
Medium-curing	476,363	3,617,180	23,724	211,538	500,087	3,828,718
Emulsified asphalts and fluxes	43,907	550,945	13,046	127,834	56,953	678,779
Paints, enamels, japans, and lacquers	13,218	173,121	12,204	114,766	25,422	287,887
Other liquid products	104,540	614,197	19,890	191,055	124,430	805,252
	1,609,204	13,107,521	559,641	5,874,744	2,168,845	18,982,265
Total: 1938	3,026,963	25,948,928	1,449,664	15,432,152	4,476,627	41,381,080
Total: 1937	2,476,454	25,478,565	1,555,499	17,515,872	4,031,953	42,994,437

Production, Refinery Movement, and Sales of Petroleum Asphalt in the United States, 1938, by Districts

DISTRICTS	Production	Receipts from Other Sources	STOCKS		Consumption at Refineries, Transfers, Losses	Sales	Sales Value
			Beginning of Year	End of Year			
	Short Tons	Short Tons	Short Tons	Short Tons	Short Tons	Short Tons	
East Coast	1,753,766	23,834	141,738	134,136	10,458	1,774,744	$18,840,860
Appalachian	113,206	1,928	17,877	14,789	300	117,922	1,489,664
Indiana-Ill.-Kentucky	632,577	10,730	152,766	108,897	34,803	652,373	6,509,542
Oklahoma-Kans.-Mo.	342,730	7,715	56,692	40,220	8,671	358,246	2,485,080
Texas Gulf Coast	210,156	1	14,043	15,451	49,454	159,295	1,412,779
Texas Inland	195,764	15,521	28,146	24,863	.....	214,568	1,402,950
Total Texas	405,920	15,522	42,189	40,314	49,454	373,863	2,815,729
Louisiana Gulf Coast	242,752	6,346	38,080	34,068	24,491	228,619	2,153,334
N. La. and Arkansas	203,899	3,932	36,281	16,486	949	226,677	1,553,073
Total La.-Arkansas	446,651	10,278	74,361	50,554	25,440	455,296	3,706,407
Rocky Mts.	162,628	9,762	21,973	23,096	5,127	166,140	1,486,292
California	649,398	15,751	49,850	78,402	58,554	578,043	4,047,506
Total: 1938	4,506,876	95,520	557,446	490,408	192,807	4,476,627	41,381,080
Total: 1937	4,359,924	41,905	364,199	557,446	176,629	4,031,953	42,994,437

troleum asphalt to other countries decreased from 167,458 tons valued at $2,453,233 in 1937 to 160,209 tons valued at $2,295,479 in 1938. The principal decreases in exports were in those to eastern and southern Asia, especially to China, Japan, British Malaya, British India, and Ceylon. Areas to which shipments showed increases included Australia, New Zealand, and French Indo-China.

Less Foreign Crude Used

Of the 4,506,876 short tons of petroleum asphalt production in 1938, 1,438,245 tons were made from foreign crude petroleum imported chiefly from Venezuela and Mexico, compared with 1,555,803 tons in 1937.

Meanwhile, production of asphalt from domestic crudes increased from 2,804,121 tons in 1937 to 3,068,631 tons in 1938.

Sales of petroleum asphalt by refineries increased 11 percent in quantity but decreased 4 percent in value from 1937 to 1938. The average value at the refinery was $9.24 per short ton in 1938, compared with $10.66 in 1937.

Highway Use Largest

Highway construction furnished a market for over three fifths of all asphalt sold in 1938. Street and road construction increased in 1938 and responsible for the gain were the higher and intermediate types of surface and grading and draining operations, as less mileage of the lighter types of surface was built in 1938 than in 1937. The increased construction of high-type, hard-surfaced streets and highways was reflected by an increase in sales of paving asphalt of less than 200 penetration from 1,162,497 short tons in 1937 to 1,271,838 tons in 1938.

An increase in sales of cut-back asphalts from 1,099,498 tons in 1937 to 1,392,997 tons in 1938 reflected a similar increase in construction of lighter types of surface, both on state highways and secondary roads, as well as continued use for soil stabilization and revetments.

The formerly rising trend in sales of asphalt emulsions was interrupted in 1938. Total sales decreased from 62,683,166 gallons valued at $5,094,033 in 1937 to 57,345,424 gallons valued at $4,338,037 in 1938.

Use in Roofing

Roofing manufacture continued to absorb a relatively large proportion of asphalt used. Sales for this purpose were larger in 1938 than in 1937, although this outlet for asphalt decreased in relative importance, having accounted for only 25 percent of all asphalt sales in 1938, as compared with 27 percent in 1937.

Shipments of prepared roofing and brick siding reported by the Bureau of the Census increased 16 percent in 1938 over 1937. But sales of roofing asphalt and flux increased only 3 percent, from 1,091,202 tons in 1937 to 1,127,635 tons in 1938.

Although construction contracts awarded, both residential and nonresidential, involved only 3 percent less floor space in 1938 than in 1937, sales of waterproofing asphalt and flux decreased from 115,681 tons in 1937 to 71,950 tons in 1938.

Road Oil Sales Down

Less extensive construction of gravel, sand-clay, and oil-treated macadam highways was reflected in a decline of 9 percent in refinery sales of road oil, from 8,713,650 barrels in 1937 to 7,904,890 barrels in 1938, according to the lately issued annual report of the Bureau of Mines on road oil. As a result of lower prices, the value at the refineries of road oil sold decreased 20 percent, from $12,183,213 in 1937 to $9,704,689 in 1938.

Imported crude, chiefly from Venezuela and Mexico, was the source of only 632,423 barrels of the road oil sold in 1938, that quantity having represented a value of $1,080,699. Of the road oil made from foreign petroleum, 77 percent was sold by refineries of the Atlantic Coast district in 1937 and 76 percent in 1938; the remainder was sold by Gulf Coast refineries.

Road Oil Sold by Petroleum Refineries in the United States, 1937 and 1938, by Districts

DISTRICT	1937		1938	
	Barrels	Value	Barrels	Value
East Coast	1,041,454	$1,718,132	943,073	$1,544,169
Appalachian	43,135	91,308	146,066	185,542
Indiana, Illinois, Kentucky, etc.	1,876,768	2,753,226	1,751,411	2,390,213
Oklahoma, Kansas and Missouri	707,032	835,275	919,151	841,264
Texas:				
Gulf Coast	289,861	486,350	239,555	360,295
Inland	2,843	3,432	2,139	2,713
Total Texas	292,704	489,782	241,694	363,008
Louisiana-Arkansas:				
Louisiana Gulf Coast	133,922	182,502	176,476	264,355
Arkansas and Louisiana Inland	395,171	457,024	129,828	170,048
Total Louisiana-Arkansas	529,093	639,526	306,304	434,403
Rocky Mountain	1,245,266	2,494,609	1,183,880	1,492,280
California	2,998,198	3,161,355	2,413,311	2,453,810
Grand Total	8,733,650	12,183,213	7,904,890	9,704,689

Chemical Formation Plugging

By P. J. LEHNHARD, Dowell, Inc., Tulsa, Oklahoma
and
HANS A. REIMERS, The Dow Chemical Company, Midland, Michigan

CHEMICAL formation plugging is now in its second year of commercial development and is proving successful. As now being commercially practiced, this process consists of injecting a clear liquid into the pores of the formation which after a predetermined length of time sets up to a firm solid, effectively preventing any fluid flow through the pores.

Early field work using the new chemical process of plugging off water was made in drilling wells because in these wells it was possible to inject the chemicals into a formation producing nothing but water or gas. In these wells, it was desirable to obtain a 100 percent shut off. A typical treatment of this nature was one made on a well in Medina County, Ohio, in which the Oriskany sand was exposed as illustrated in Figure 1. Total depth was 2034 feet, and 20 feet of porous sand was encountered in the Oriskany from 1928 to 30 feet and 1962 to 80 feet. Eight and five-eighths inch casing was set at 265 feet and an anchor packer was set at 1913 feet with perforations almost at the total depth. The well was capable of producing water at the rate of about four barrels per hour. Temperature at bottom of hole was 94°.

In treating this well, a test was made to see that the packer was actually holding, and when it was found that the packer would hold 500 pounds differential pressure without failing, the chemicals were mixed at the surface and introduced down the tubing. When all the chemicals were in, water was pumped down the tubing to force the chemicals out into the formation. The well was shut down for a sufficient period of time for the chemicals to form a solid plug and the well was then opened up and tested. It was found that a 98 percent shut off was obtained, and operators were able to drill ahead without any trouble at all from the upper water.

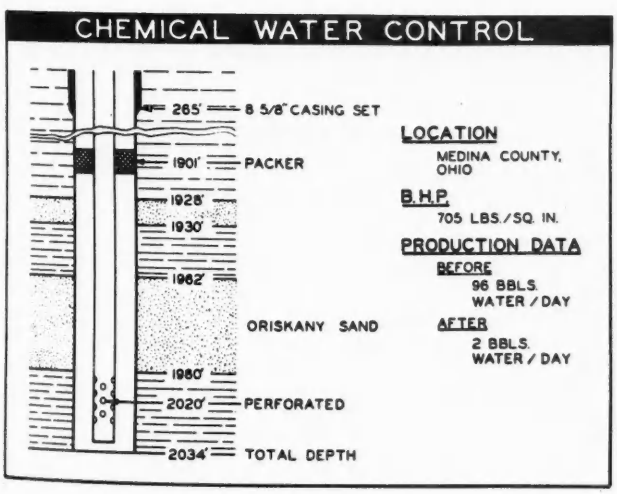


FIGURE 1

Formerly in this type well, 10-inch pipe was used as surface pipe. Eight inch was run through Berea sand, through Bedford shale below the Berea which caves with water contact, and through Oriskany sand and the Big lime, all of which carry water. The 5 or 6 inch production string was landed above the Clinton gas horizon. Formation plugging opens possibility of using only strings of 8 and 6 inch. The eight inch would be run through the surface formations, the Berea water sand and shale below. Formation plug would be used in the Oriskany and Big Lime if water was found to be present and 6 inch set on top of the Clinton.

An interesting and successful treatment was performed on a well producing from the Misener sand in Creek County, Oklahoma, illustrated in Figure 2. This well had been completed approximately 12 years

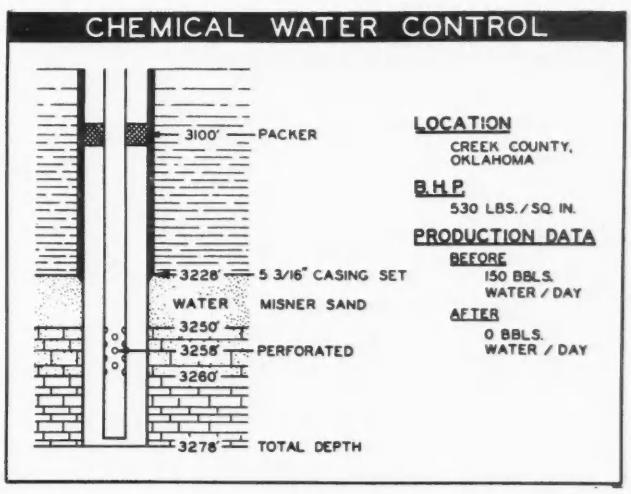


FIGURE 2

prior to the treatment with an initial production of 450 barrels of oil and no water. After 12 years of production, the well had declined to five barrels of oil and 150 barrels of water per day. Operators of this well considered that this production was not sufficient to justify continued operation, and therefore, decided to deepen to the underlying Wilcox. The well had been completed with 5-3/16-inch pipe set above the Misener, and the operator did not wish to set 4-inch pipe on top of the Wilcox.

The well was treated with 1000 gallons of chemical plugging liquid. An anchor packer was set at 3100 feet in the 5-3/16-inch pipe. Before treatment, 500 pounds pressure were applied to the tubing to be sure that the packer was holding satisfactorily and, when this was found to be the case, the chemicals

were mixed and introduced into the well under very low pressure. The chemicals left in the tubing were then flushed out of the tubing and into the formation with a sufficient amount of water. The well was shut down the required length of time for the chemicals to set up to a firm plug.

Following treatment, the well was opened up and put on production. It was found that absolutely no fluid was produced from the Misener following treatment and that a 100 percent shut off had been obtained.

Total depth at the time of treatment was 3278 feet. The operator began deepening the well and has now completed it at 3353 feet in the Wilcox sand. The Wilcox was shot with 60 quarts and production figures show it to be making 210 barrels of oil per day and no water, flowing through the casing.

The importance and value of formation plugging was well illustrated by two treatments made on a well in Seminole County, Oklahoma, being drilled to the Simpson. Figure 3 shows data on this well. The Simpson was cored and water was found from 4349 to 4352 feet. Seven inch pipe was cemented at 4353 feet, 2 feet off bottom. Initial production test showed

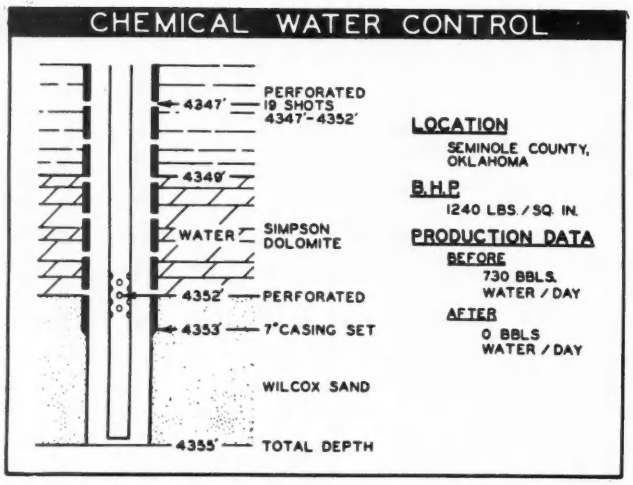


FIGURE 3

that the shut-off was not tight or that sratigraphic information was in error for the well produced only water. Failing to satisfactorily complete, operators decided to apply chemicals to the well and 1600 gallons of chemical plugging material was introduced into the open formation and through perforations in the water zone, at a maximum pressure of 1000 pounds. After treatment, it was found that production had decreased slightly, but this drop was short-lived as after a few days the output increased to near normal. Although some water was still being produced, the first chemical treatment was sufficiently encouraging that a second application was made; using 3000 gallons of chemical with the result that the water production dropped to one-half barrel per day. It is believed that the first application would have given a complete shut-off had not stoppage of the natural pore space of the strata prevented equal penetration of plugging chemicals into the formation.

Chemicals Used in Formation Plugging

In the last several years, many chemical methods have been proposed for the control of unwanted water and gas flows.

Kennedy,[1] before the annual meeting of the American Institute of Mining and Metallurgical Engineers at New York, presented basic problems and theories. This was augmented by Hefley, Kennedy and Fitzgerald[2] at the San Antonio meeting of the petroleum division of the same organization, and again by Fitzgerald[3] at the Pittsburgh meeting of the Eastern Division of the American Petroleum Institute in April of this year.

The literature cited above mentions several types of chemicals that have been suggested for plugging the formation. The first type is a group of chemicals which react with certain constitutents of the brine present in the formation to form solid plugging agents. Examples of such chemicals are sodium silicate, sodium carbonate, and sulphuric acid. If these chemicals are brought in contact with brine containing calcium or magnesium salts, precipitates will be formed back in the pores and these will tend to plug the formation.

Present data indicate that these materials do not produce a satisfactory plugging action because the precipitate will be forced out of the pores by a relatively low pressure differential. Although a precipitate is formed in the pore space of a formation, this alone is not sufficient. The precipitate must combine volume and tenacity, the latter being in a measure dependent upon the volume formed. However, despite large volumes of a precipitate, if it is thin or mobile only a slight difference in pressure between the well and the formation would be required to exhaust the plugging material into the hole.

Kennedy[1] has discussed the use of various chemicals "which form voluminous precipitates on contact with water, itself, and in which the volume of the precipitates is limited only by the amount of water available to react." He lists antimony trichloride, which forms a voluminous precipitate of antimony oxychloride when in contact with water, and also silicon tetrachloride, which forms a voluminous precipitate of silicic acid. Also listed as possibilities are superfatted soaps, finely divided cements made up in nonaqueous suspensions, and colloidal solutions which on dilution or contact with salt water are precipitated and form precipitates many times larger than may be obtained by the usual reaction involving exchange of radicals. Data is available to prove conclusively that some of these methods do work, and successful results have been obtained as outlined by Kennedy. However, the presence of a satisfactory amount of water in the formation is required, and the cost of the chemicals used is appreciable. Other chemicals are now being used in commercial field work.

A third type of chemical has been suggested by Swan,[4] involving solidifying naphthalene vapor in the formation. Naphthalene has a boiling point of about 424 Fahrenheit and melts at about 176°.

Field work at the present time is being conducted with a mixture of chemicals which may be introduced into the well in liquid form but which will set up into a firm plug in a controlled length of time without requiring the presence of any materials such as water or calcium or magnesium salts for completion of the reaction and without requiring unusual temperature or pressure conditions as is the case when solidifying naphthalene vapor in the formation. The simplicity of this type of chemical mixture is desirable. The chemicals are mixed at the surface of the well-site, introduced into the well, forced back into the formation and simply allowed to stand until a firm plug has been produced. Although temperature

conditions may affect the time necessary for the plug to set up, such factors can be taken into consideration in preparing the mixture. No water oil, gas, or salt, either in solid or solution, is required to be present in the formation. For this reason, the plug should be considered as non-selective in that it will set up in any porous zone regardless of the type of fluid produced from the zone.

Fitzgerald,[3] in the paper presented to the American Petroleum Institute in April, 939, has stated in part: "This new chemical formation plug is a mixture of several chemicals which sets up to a firm mass after a predetermined and controllable length of time. A number of different mixtures have been found which exhibit these properties. All are three or four component systems; that is, each contains three or four different materials. As solutions containing the same materials, but in different percentages, exhibit radically different setting times and hardness of the final product, it was necessary to investigate all possible compositions of each system in order to find specific mixtures which would be applicable both to well treating and to the many conditions likely to be encountered."

As explained in this paper, one set of constitutents which produces a mixture with these properties is ammonium bicarbonate, sodium silicate and water. If these materials are plotted in a triangular diagram,

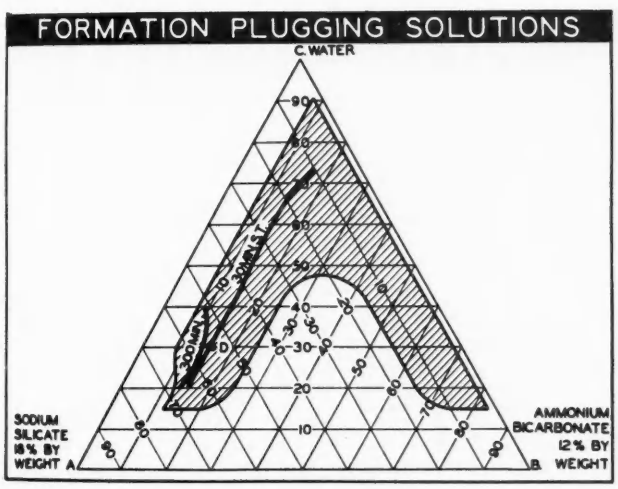


FIGURE 4

as shown in Figure 4, it is possible to show the approximate setting times of these solutions at any given temperature. Figure 1 is based on data obtained at a temperature of 120° F., an average of subsurface temperatures as found in all fields.

The triangular diagram is not based on pure sodium silicate and pure ammonium bicarbonate but rather on solutions of 18 percent sodium silicate and 12 percent ammonium bicarbonate all as shown on this diagram. Point A represents 100 percent by volume of an 18 percent solution of sodium silicate, Point B represents 100 percent by volume of a 12 percent solution of ammonium bicarbonate and point C represents 100 percent by volume of water.

In this method of plotting, it follows that a specific point in the diagram can be obtained only by mixing definite percentages of the three base materials and that the points within this diagram represent all possible mixtures of the three base materials in the concentrations shown.

An area on this diagram has been cross hatched to indicate the mixtures of the three components which will form a clear solution but which will later solidify. The area outside of the cross hatched area represents compositions which either form a solidified product immediately on mixing or never form a solidified product even after standing an infinite time. Within the cross hatched area, the setting time varies widely. Those mixtures which contain low sodium silicate content on the right hand side of the chart possess a very short setting time and are of no commercial importance because sufficient time is not available to mix the chemicals at the well-site, introduce them into the well and force them back into the formation before setting has taken place. The left hand side of the cross hatched area in the vicinity of the thirty minute and the three hundred minute setting time lines represents the mixtures with longer setting times and those that are of greater interest from a commercial and engineering standpoint.

It has been stated that this diagram is based on 120° Fahrenheit. As is typical of most chemical re-

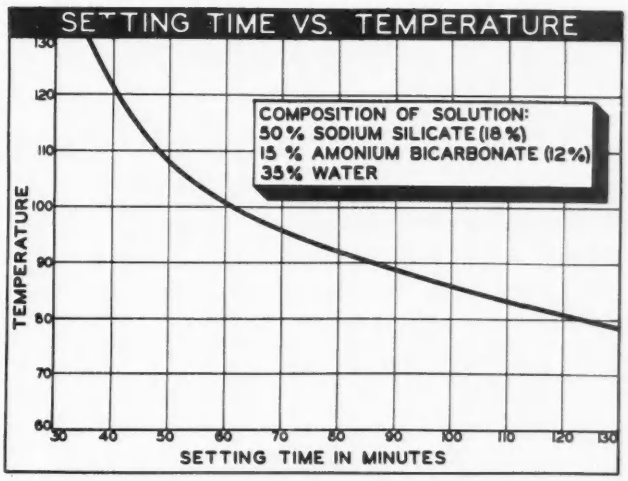


FIGURE 5

actions, temperature has a very decided influence on the setting time or the rate at which reaction takes place. As the temperature goes up, the rate of reaction increases materially as indicated in Figure 5.

Mechanics of Setting

The mixture of chemicals found satisfactory for successful field work is an interesting one. The chemicals are all liquid when mixed together, and produce a resulting mixture which remains liquid for a controllable period of time and then sets to a firm plug in the pores of the formation. Mixtures have been found which exhibit practically no shrinkage on setting.

The sodium silicate in the solutions used in Figure 4 may be considered to be a mixture of Na_2O and SiO_2. Specifically, the silicate in these solutions contain enough atoms to form approximately Na_2O-33 SiO_2. This solution is highly alkaline. Upon mixing with ammonium bicarbonate as illustrated in Figure 4, silicon hydroxide or silicic acid is formed as a sol or colloidal solution with a water solution of sodium carbonate and ammonium hydroxide as the liquid phase.

This chemical reaction is very simple and involves merely several exchanges of radicals. The novel and interesting thing is the behavior of this colloidal solution.

The sol or colloidal solution is capable of under-

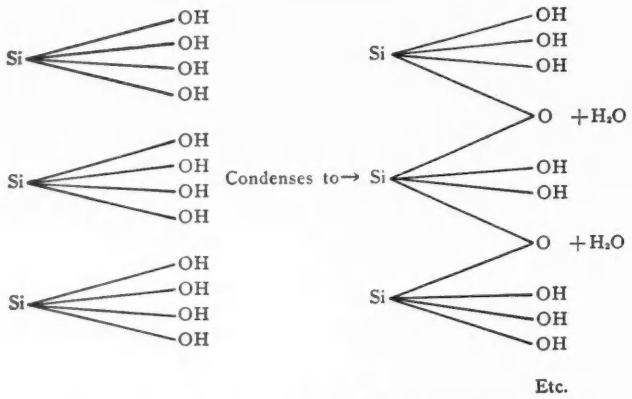
going a very definite change in form. First, it becomes semi-solid, then an elastic gel, then it loses its elasticity and becomes more rigid or firm, and finally becomes increasingly hard and non-elastic.

These silica sols may be looked upon as unstable systems that have a continuous tendency towards coagulation. The mixtures which result in silica sol are at first quite clear, colorless liquids that apparently contain no colloidal particles but as the mixture stands, a faint opalescence becomes visible, which increases until a silica sol forms. This sets to a clear, translucent mass.

The viscosity of the sol is nearly that of water and shows at first no noticeable change until the opalescence becomes quite marked. Then, shortly previous to the actual setting, the viscosity rises sharply. Soon the sol develops elasticity and becomes a solid.

This peculiar property is thought to be due to the simple silicic acid molecule joining together to form long chains of very large and heavily hydrated poly-silicic acid molecules. These large molecules agglomerate and intertwine to form a very complex structure in which there are two continuous phases, one liquid and one solid. The solid phase absorbs the liquid phase in the pores similar to a sponge.

The formation of large poly-silicic acid molecules is a product of a condensation mechanism during which silicic acid molecules condense by giving off water as follows:



The water resulting from the condensation remains in the structure either combined or absorbed. The condensation mechanism explained here is thought to occur for many highly technical and involved reasons but it is interesting to note that the molecular weight of the poly-silicic acid reaction product increases rapidly and materially. In a freshly prepared sol, the silicic acid appears to be in the form of simple molecules of low molecular weight. After 45 days, the molecular weight increases to about 8300 and one investigator has reported a molecular weight of 49,000 by use of the freezing point method.

Water Coning

The application of formation plugging to a formation producing both water and oil for the purpose of cutting down only water production is much more involved, but is as important, if not more so, than other applications discussed previously.

When a well is first drilled into a producing formation containing an established water table, as shown in Figure 6, it is entirely probable that the oil-water interface is horizontal. As production is obtained from the well, a decrease in pressure at the well bore occurs and this decrease in pressure extends back into the drainage area. However, by far the greatest percentage of the pressure differential is to be found immediately adjacent to the well. The theoretical pressure distribution about the well has been computed by Muskat[5] and others,[6] and approximately 50 percent of the differential might be expected within a five-foot radius of the well.

If the well is produced at a sufficiently slow rate, no water will be produced, but rather only oil, which obviously leads to the conclusion that flow of fluids in the formation is essentially in a horizontal direction rather than vertical. However, the water level immediately below the well bore rises to form a "hump" so that an equilibrium condition can be established, as shown in Figure 6. The distance that water will rise towards the well above the horizontal oil-water interface varies with the pressure differential between the pressure at the well and the pressure back in the drainage area and also with the difference in densities of the oil and water in the reservoir. If the production of the well is increased sufficiently or if the water table rises over a period of time, water will be brought up to the well in the form of a "cone" as shown in Figure 7. A thorough discussion of this phenomenon is contained in "Flow of Homogeneous Mixtures," by Muskat.[7]

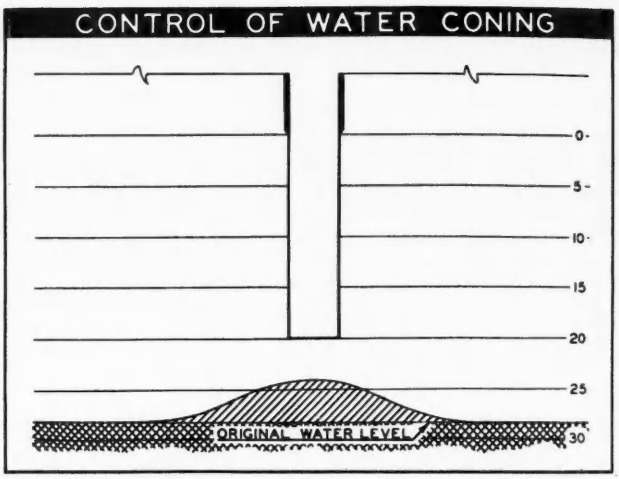


FIGURE 6

When the water table has risen due to production establishing a water cone reaching up to the well bore, field practice is to work over the well either to

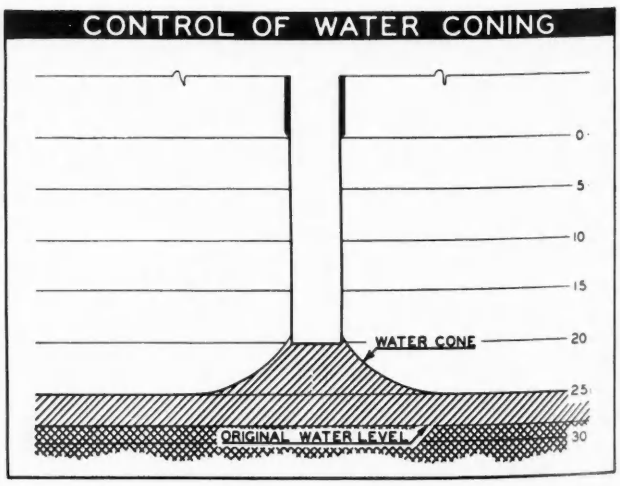
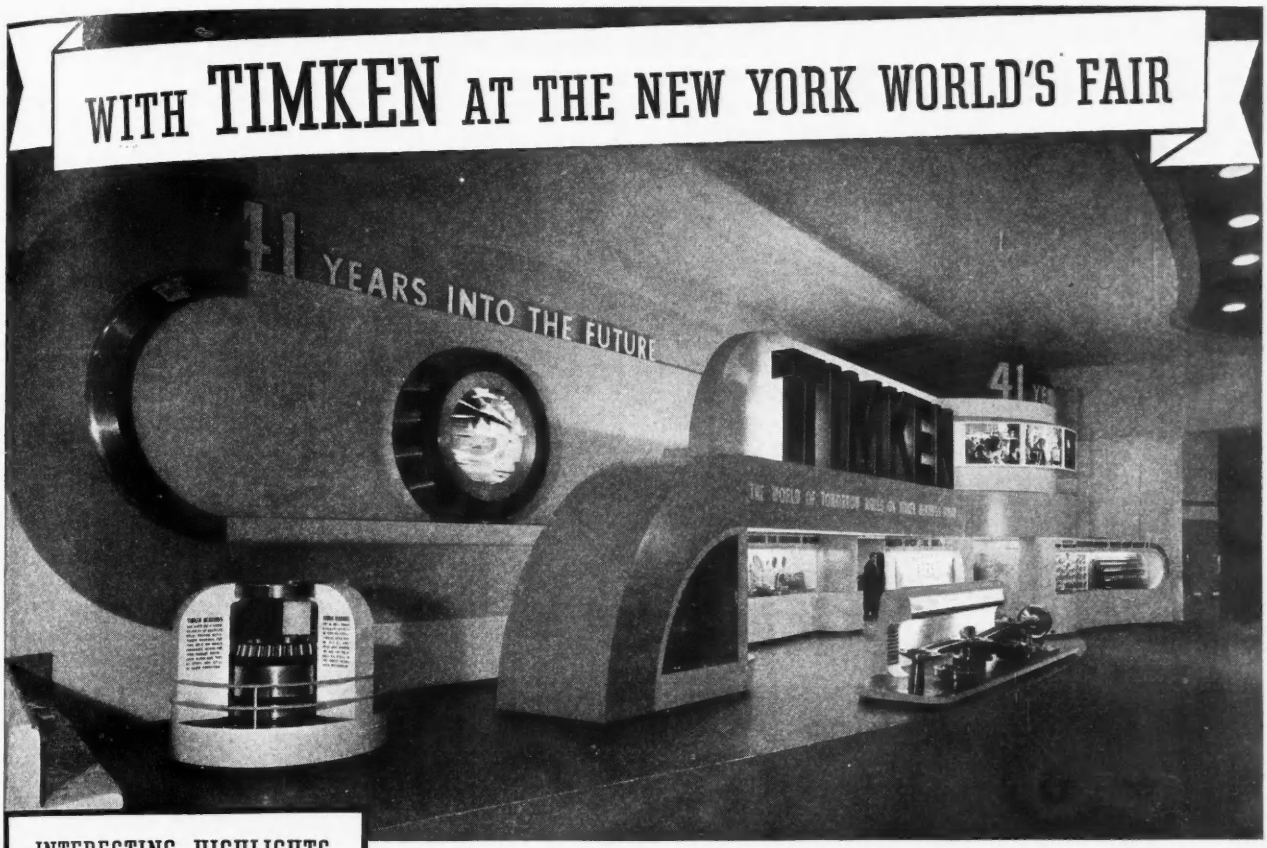


FIGURE 7

WITH TIMKEN AT THE NEW YORK WORLD'S FAIR



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Equally impressive are the displays of other TIMKEN Products; including TIMKEN Alloy Steels, TIMKEN Alloy and Carbon Steel Seamless Tubing, TIMKEN Rock Bits, and TIMKEN Fuel Injection Equipment for fuel oil burning engines.

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One of the principal objects of the Timken Exhibit is to help increase the sales of Timken Bearing Equipped products. In this respect its value to the product manufacturer cannot even be estimated. The Timken Exhibit is located in the Metals Building adjacent to the Trylon and Perisphere.

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decrease the height of the cone as a means of decreasing water/oil ratios, or to plug back the well bore and the adjacent formation, changing the pressure gradients and altering the size and effect of the cone. Here again, the chemical method of blocking the pore space in a formation is applicable. Chemicals are forced by pressure horizontally into the formation where they set up; the result being that the pressure gradient is changed and further rise of the cone is delayed.

Methods of Plugging Wells Producing Oil and Water

The discussion of the chemicals used in present field work has stated that the chemical will set up in any formation in which it is placed regardless of previous contents of that formation. This chemical is not selective in a chemical way, and, therefore, proper application must depend upon mechanical methods of placing the chemical in the formation for proper results. There have been two methods used that have obtained the desired results, and this indicates that in general successful plugging for this purpose is close at hand. In the first method, packers have been set in the formation and used to direct the chemicals into the desired part of the formation. In the second method, the entire formation has been plugged and desired portions opened up with nitro glycerine shots.

A well treated in Seminole County, Oklahoma, with less than 1000 gallons of formation plugging chemical mixture was producing 15 barrels of oil and

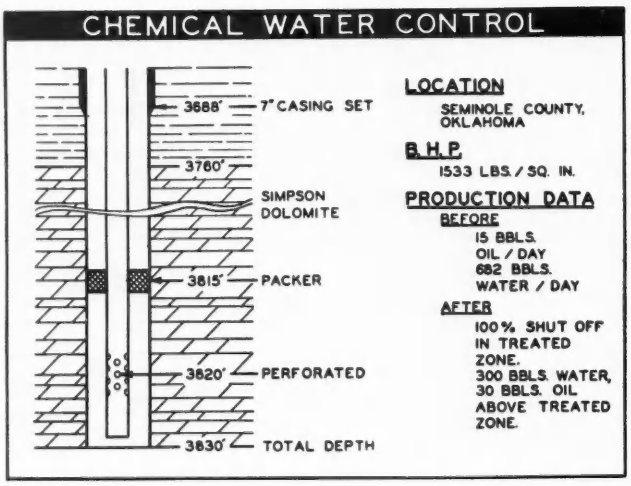

FIGURE 8

682 barrels of water per day from the Simpson dolomite. See Figure 8. This well had been completed for an initial production of 460 barrels of oil and 380 barrels of water per day, and at time of treatment was pumping as much fluid as pumping equipment would handle. The producing formation extended from 3760 to 3830 or a distance of 70 feet, and by study of the well prior to treatment, it was found that the bottom zone was producing nothing but water. Therefore, a packer was set at 3815, or 15 feet off the bottom, and the treating chemicals directed only into this bottom 15 feet.

A 100 percent shut off was obtained in the bottom 15 feet with the result that following treatment the water production approximated 300 barrels per day and oil production was over 30 barrels per day or more than a 100 percent increase. The increase in oil may be explained very easily. With the bottom part of the formation shut off, the pumping equipment was large enough to produce all the oil and water coming out of the upper part of the Simpson. Previous to treatment, the upper part of the formation had been produced only to partial capacity, apparently about 50 percent of capacity, and following treatment, the upper part was produced to 100 percent of capacity.

An example of the second experimental method of selectively shutting off water is a well treated in Pottawatomie County, Oklahoma, which on actual test prior to treatment produced 0.44 barrel of oil

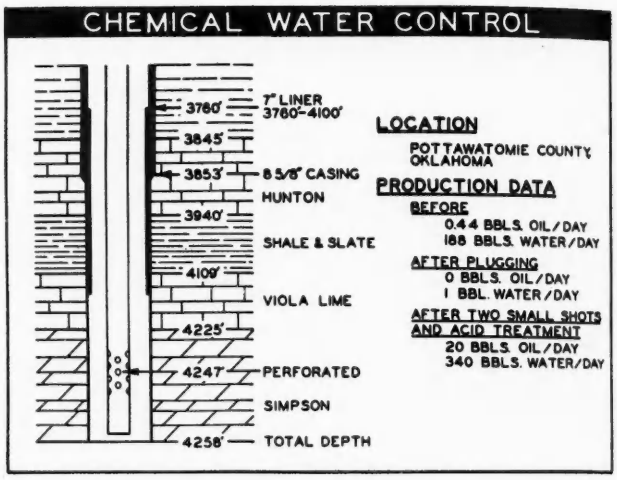

FIGURE 9

and 188 barrels of water per day. Figure 9 gives data on this well. This well was treated with 1500 gallons of chemical mixture in an attempt to plug off the entire producing section regardless of what was produced. This treatment was successful, and after treatment production from the well was 0 barrel of oil and 1 barrel of water per day. A part of the formation was then shot with 5 quarts of liquid nitro glycerine and the test following the shot showed a production of 2 barrels of oil and 2 barrels of water per day. The same section was shot again with 10 quarts of liquid nitro glycerine and following the second shot, the production increased to 3 barrels of oil and 9 barrels of water per day.

Following these two shots, the well was acidized with 1000 gallons of inhibited acid and production increased to 20 barrels of oil and 340 barrels of water. This production was maintained for three weeks following treatment and showed no signs of decreasing.

The results of the formation plugging experimental treatment, two shots, and one acidizing treatment were an increase in oil of 4450 percent and an increase in water of only 81 percent. This tremendous difference in production increase proves the selectiveness of this method of treatment provided data is known on the location of oil and water producing horizons.

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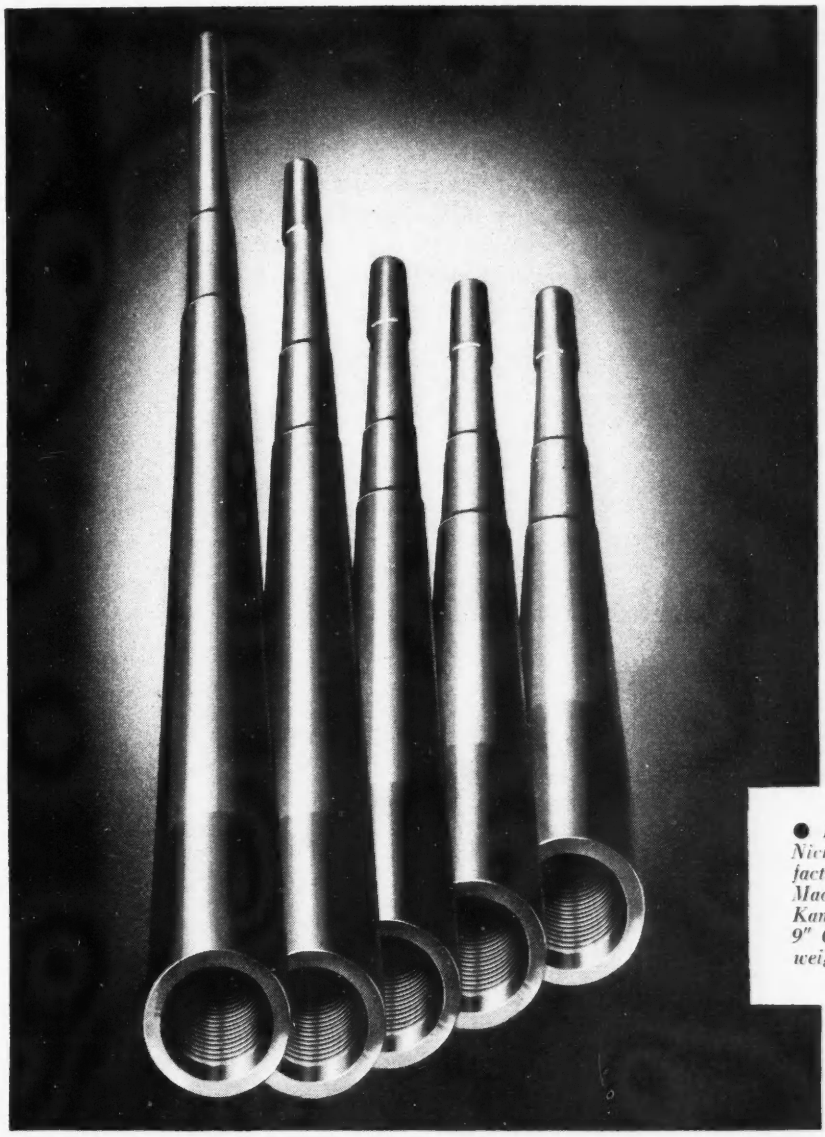

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Consultation on the use of Nickel alloy steels is invited.

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THE accurate and economic design of gas transmission lines is a complex problem, the mathematical solution of which does not appear thus far in the technical literature. The present article is an attempt at solving this intricate problem when the lengths of the individual branches of the distribution system are known. In the case of a long distance high pressure transmission line, a new unknown, the spacing between the various compressor stations, is introduced. The theoretical solution of this last problem is not known.

The Economic Design of Gas Transmission Lines

By SYLVAIN J. PIRSON

Head, Petroleum and Natural Gas Engineering Department,
The Pennsylvania State College, State College, Pennsylvania.

TRANSMISSION of fuel gas at long distance is an engineering problem which has been solved in a practical way within the last decade and the use of this method of transportation seems destined to a brilliant future. There is already contemplation of the time when coal as such will not be transported any longer in bulk from the mines to the large cities and centers of industrial consumption but when its stored energy will be transported under the form of water gas, blue gas and other gaseous forms. To this date long distance transmission of manufactured gas is not resorted to on a large scale and the bulk of the gas energy transported by pipe line is in the form of natural gas.

Yet, if the practical realization of a gas transmission line is a feasible matter, its economic engineering design is made on an empirical basis. Davis and Terry[1] have perhaps presented the best approach to a solution of this kind in an article dating already a decade back. Similarly, Kepler[2] has made, at about the same time, a study of the factors affecting the cost of building a gas transmission line. Some of the results of this study will be partly used in the establishment of the present theory.

The problem of designing a gas transmission line has various aspects. In one case, the various centers of consumption which it is desired to serve are known and the probable market demand at each one of the centers may be properly estimated and allowance made for the future increase in demand. Here the problem involves two unknowns, if it is desired to design a distribution system which will require the minimum exploitation costs, mainly the diameter of the pipe and the inlet pressure. The solution of this problem is relatively simple and is attempted in the present paper.

In the other case, it is desired to transmit gas under high pressure from a center of production to a center of consumption far removed from the former. Here, it will be necessary to install compressor stations at regular intervals along the line and the most economical spacing of those stations is a new unknown now introduced into the problem. The solution of this last problem will not be attempted in the present paper.

In all problems dealing with the flow of gas under pressure in a cylindrical conduit the equation of flow established by Weymouth[3] in 1912 is used. This formula is recognized as being the most accurate, and deviations in the calculated flow and measured flow are of the order of 0.5 percent. Weymouth's formula is derived by application of the well known hydraulics principle of mechanical energy balance between inlet and outlet. This is most commonly known as Bernouilli's equation for incompressible fluid flow; in the case of gas, however, the work of expansion must be added. The derivation of the standard flow formula for gas has been made recently by Johnson and Berwald[4] and is given under the form

$$Q = K \frac{T_a}{P_a} \left[\frac{(P_1^2 - P_2^2)\, d^5}{G\, T\, L\, f} \right]^{1/2} \qquad (1)$$

which formula is also recommended by the American Gas Association. Weymouth had previously derived an identical formula by using the theory of Professor Unwin as expressed in 1904 before the British Institution of Gas Engineers. However, it is to Weymouth

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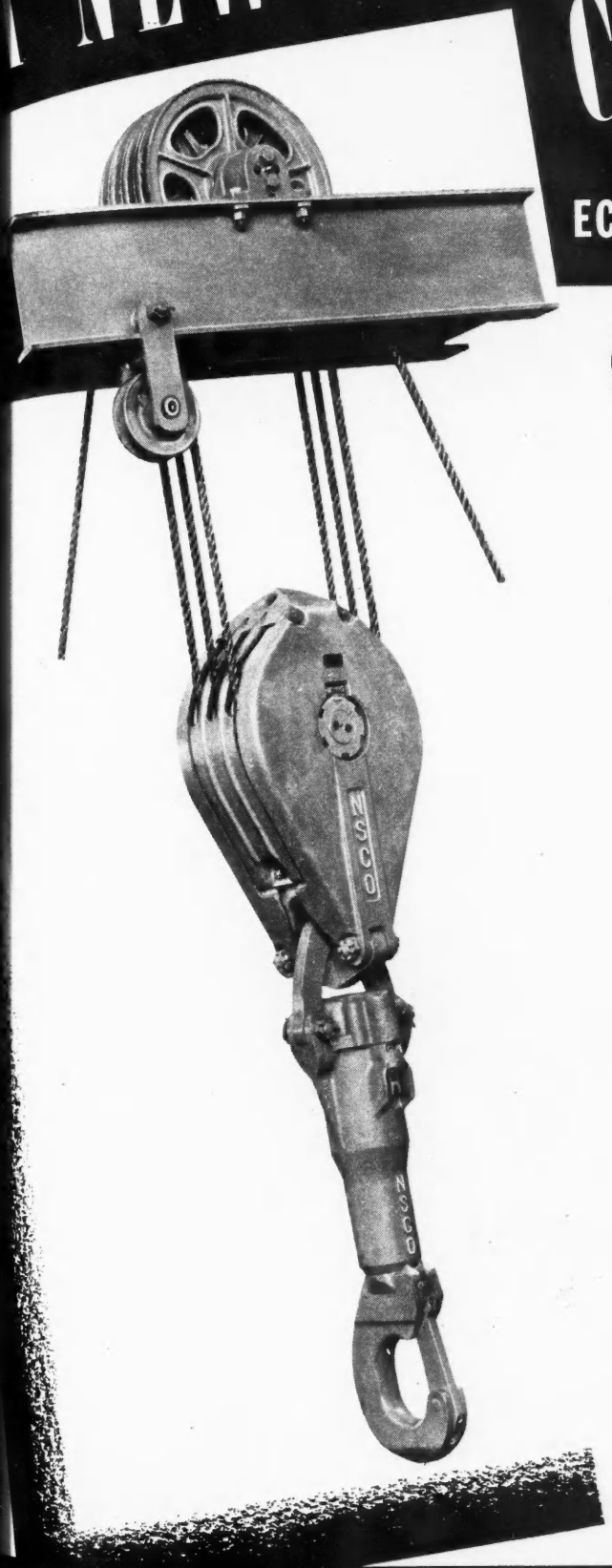

1 The New Ideal 4-sheave Type D-6 Rotary Crown Block—sheaves are carried on dust and oil tight individually lubricated double row Timken bearings — spacers are unnecessary resulting in a narrower and stronger construction as well as eliminating spacer friction and wear — rated safe working load is 160,000 pounds—sheaves and bearings interchangeable with those on Ideal Type D-6 Traveling Block. For further details ask for Bulletin No. 241.

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3 The New Ideal Type D-6 Rotary Hook—a narrow, streamlined hook of advanced design — has multiple position locking device — closed link design increases load capacity — tongue acts as guide and automatically locks in position when bail is engaged — hook and bail members are of alloy steel heat treated for maximum strength and wear resistance—all working parts fully enclosed against water and grit—rated capacity 60 tons—other desirable features are fully described in Bulletin No. 243.

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that is due the elimination from formula (1) of the friction factor f. He observed that f is a function of the diameter of the pipe according to:

$$f = \frac{.008}{d^{1/3}} \qquad (2)$$

and when substituting relation (2) into (1) one obtains the original Weymouth formula:

$$Q = K \frac{T_a}{P_a} \left[\frac{(P_1^2 - P_o^2)\, d^{\frac{16}{3}}}{G\,T\,L} \right]^{1/2} \qquad (3)$$

In relation (3) the letters have the following meaning:

- Q: volume of gas in cubic feet per hour at a pressure base of P_a and a temperature base of T_a
- K: a constant
- P_a: base pressure in pounds per square inch absolute
- T_a: temperature base in degrees Rankine
- P_1: inlet pressure in pounds per square inch absolute
- P_o: outlet pressure in pounds per square inch absolute
- d: internal diameter of the pipe in inches
- G: specific gravity of the gas (Air = 1)
- T: temperature of the flowing gas in degrees Rankine
- L: length of the pipe in miles.

For the purpose of this article the following values will be assumed:

$T_a = 520°$ F., $P_a = 14.7$ lb. per sq. in., $G = 0.65$, $T = 520°$ F.

Weymouth's formula becomes then:

$$Q = K \left[\frac{(P_1^2 - P_o^2)\, d^{\frac{16}{3}}}{L} \right]^2 \qquad (4)$$

where K has for value: 34.8. Formula (4) will be used throughout the present theory.

Factors Affecting Pipe Line Cost

Three main factors affect the cost of building and operating a gas transmission line. They are:

1. The cost of the pipe;
2. The cost of laying the line and installing compressor stations;
3. The cost of operation.

These will be successively reviewed.

I. *Cost of the Pipe*

The cost of the pipe is determined by the amount of steel which it is necessary to provide in order to give sufficient thickness and diameter to carry the required volume of gas at the prevailing pressure. The relation between the volume of gas transmitted per hour, Q, the diameter of the pipe, d, and the prevailing pressure, P_1, is given by formula (4). The walls of the pipe must further be of sufficient strength, and the thickness, t, in inches may be calculated by Barlow's stress formula:

$$t = \frac{P_1\, d}{2\,S} \qquad (5)$$

where S is the permissible fiber stress (hoop stress) in pounds per square inch. The value of S will conservatively be 15,000 pounds per square inch for the quality of steel used in gas line work.

Knowing the pipe thickness, t, the weight of steel per mile of pipe, W, may be calculated by:

$$W = 28.2\ (d - t)t \qquad (6)$$

where W is expressed in tons.

Thus the weight of pipe per mile as a function of pressure and diameter is obtained in combining (5) and (6) giving:

$$W = 28.2 \left(d - \frac{P_1\, d}{2\,S} \right) \frac{P_1\, d}{2\,S} \qquad (7)$$

Pipes for gas transmission are normally sold on a weight basis plus freight. This amounts on the average to about $100 per ton. The cost of the steel may thus be readily obtained from formula (7).

II. *The Cost of Laying the Line*

Cost Varies With Terrain

A second important factor entering into the total cost of a distribution line is the cost of laying the main. This cost will vary within large limits according to the nature of the ground traversed. In general this cost may be distributed among several items:

(a) It has been noticed that the cost of such items as surveying, right of way, clearing, telephone and supervision, is virtually independent of line size and the cost estimate per mile may vary from one thousand to three thousand dollars, depending upon the type of country traversed.

(b) The cost of hauling, unloading, aligning, placing and welding or coupling is a function of the weight of the pipe.

(c) The cost of ditching, painting, back-filling and necessary equipment is a function of the diameter of the pipe.

Laying cost may thus be calculated by the following empirical formula according to Kepler (2):

$$C = 3000 + 12W + 260\,d \qquad (8)$$

in which C is the cost of laying in dollars per mile.

W is the weight of steel in tons per mile
d is the outside diameter of the pipe in inches

For long transmission lines, the cost of installing compressor stations at regular intervals along the line should be included. However it will be supposed here that a single compressor station is required for the system under study.

III. *The Cost of Operation*

The cost of operation includes the cost of transmission and the investment charges.

Essential Data

In order to evaluate the cost of operation it is necessary to know or estimate the following data:

h: the average hours of utilization per day

t: the daily interest rate on invested capital. This may usually be taken at about 14 percent per year in order to take care of maintenance, taxes, interest and amortization.

C: the cost of the unit of energy for driving the compressors.

U: the cost of the compressor per H.P. This is of the order of 100 to 140 dollars per H.P.

V: the fixed investment in compressor station which varies from 40,000 to 100,000 dollars. This factor includes the cost of buildings attendant to the erection of compressor stations.

(a) **The cost of transmission.** The cost of transmission per cubic foot of gas is a function of the compression ratio. In fact the work necessary to compress

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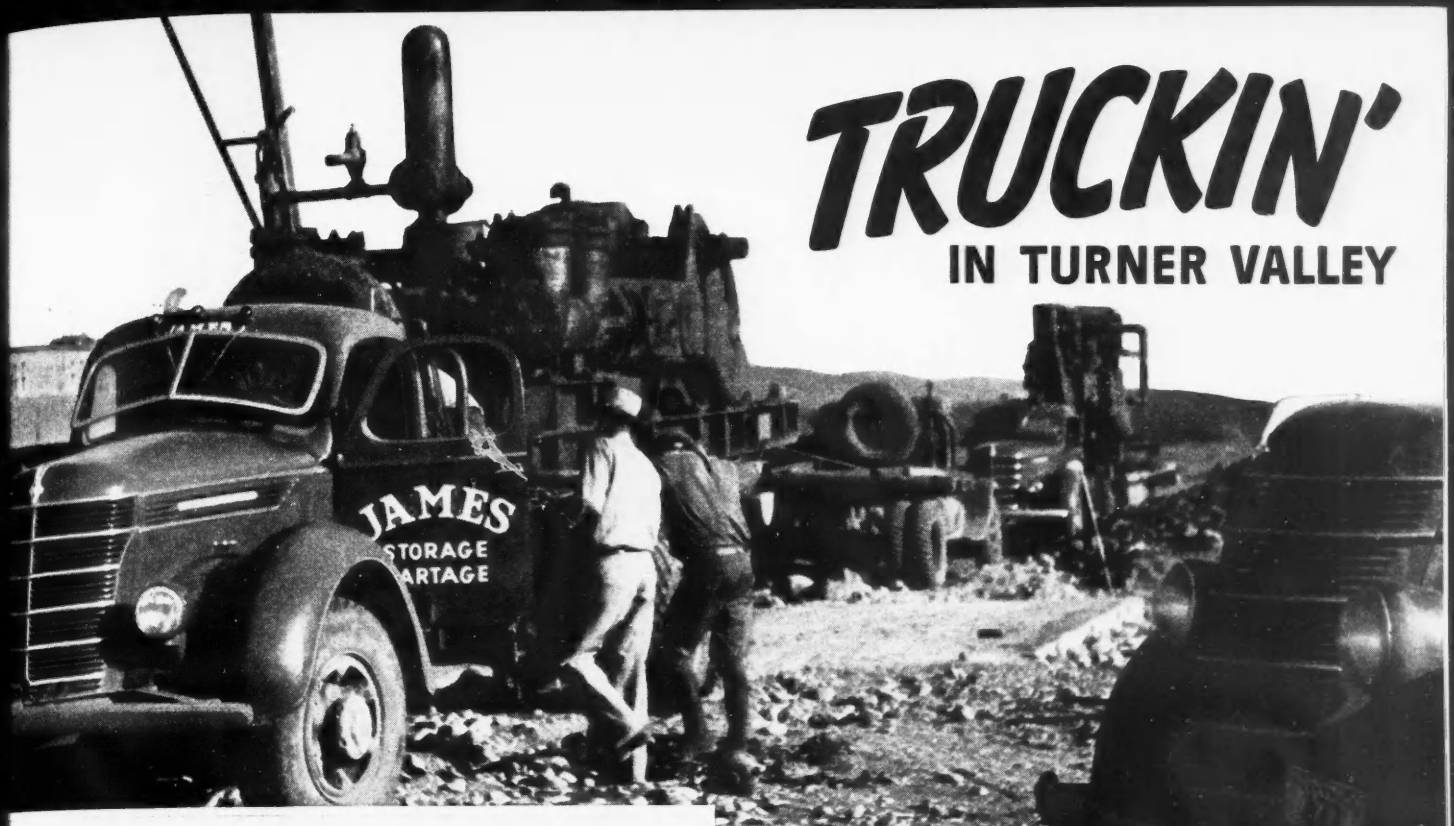

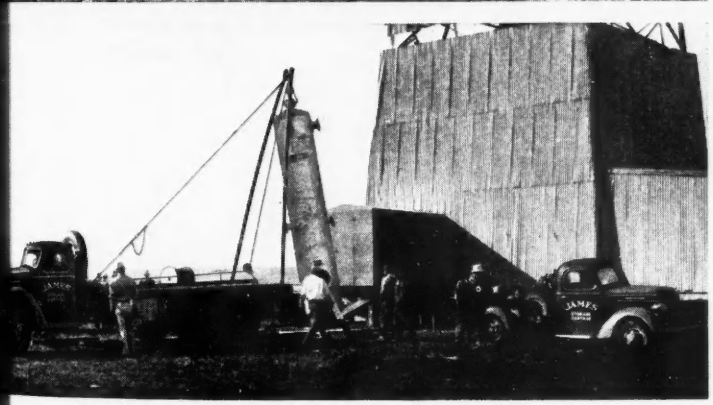

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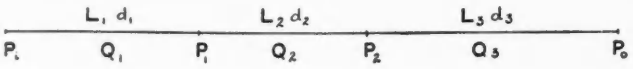

FIGURE 1A
Complex Distribution System

one cubic foot of gas taken at standard conditions is given by the relation

$$144 \times 14.7 \ln \frac{P_i}{P_a} \qquad (9)$$

which indicates that the compression ratio $\frac{P_i}{P_a}$ will influence the cost of transmission according to a logarithmic law.

Taking into account the building and fixed charges, the cost of transmission per cubic foot becomes

$$\frac{14.7 \times 144}{33{,}000 \times 60} \left(c + \frac{U t}{h} \right) \ln \frac{P_i}{P_a} + \frac{Vt}{hQ} \qquad (10)$$

(b) **The investment charges.** These include the interest charges on the invested capital in the pipe line distribution system.

This may be calculated by means of equations (7) and (8). Substituting the value of W in (8) and adding the cost of the steel, the total cost of the pipe line may be obtained by:

$$\text{Total cost} = 3000 + (100 + 12)\, d^2 \left(1 - \frac{P_i}{2S} \right) \frac{P_i}{2S} + 260\, d \qquad (11)$$

Normally the value of P_i does not exceed 600 pounds per square inch and the value of S may be taken as 15,000 thus in relation (11) the factor $\frac{P_i}{2S}$ may be neglected with respect to one. The total cost of the line then simplifies to the following expression:

$$\text{Total cost} = 3000 + 260\, d + .105\, d^2 P_i \qquad (12)$$

and substituting the symbols α, β and τ in 12 for the values of the coefficients:

$$\text{Total cost per mile} = \alpha + \beta d + \tau d^2 P_i \qquad (13)$$

which expression gives the law of variation of the cost of a mile of pipe as a function of its diameter and the pressure of the gas which it transmits.

Should the transmission line have a length L in miles, the interest charges per cubic foot would be:

$$\frac{tL(\alpha + \beta d + \tau d^2 P_i)}{hQ} \qquad (14)$$

The total operating cost per cubic foot of gas is thus given by the final expression

We are now in possession of the necessary laws of cost variation as a function of diameter and pressure in order to study the most economical diameters and pressures to be used; these laws are mainly Weymouth's equation (3) and equation (15).

Since we have at our disposal but two equations, only two unknowns may be solved for, mainly for the diameter and pressure. In order to calculate the most economical separation between booster stations a third relation would be necessary.

Possible Problems

Generally two problems may be solved by means of the fundamental relations established above. namely:

1. Given the length and the output of each branch of a complex gas distribution system and the inlet and outlet pressure at each branch, calculate the most economical diameter of each branch.

2. Given the lengths and the outputs of each branch of a complex gas distribution system and the outlet pressure of each branch, calculate the most economical diameter of each branch and the most economical inlet pressure.

It will be noticed that the fundamental difference between the first and second problems rests in the number of unknowns for each branch. The first problem has only one unknown, the diameter, whereas the second requires the calculation of both the diameter and the inlet pressure. The first problem may be solved by means of Weymouth's equation alone whereas the second requires the combination of equations (3) and (15) for its solution.

First Problem

As the inlet pressure is imposed for the first problem the compression costs need not be taken into consideration, and equation (13) will express the variation of the pipe line cost with diameter and pressure.

The geometry of the distribution layout system is, of course, known from the location of the centers of consumption. The individual requirement of each center may also be estimated and allowance made for possible increase in demand in future years. A layout such as given in Figure 1 may thus be determined in which the known quantities are the length, (L), of each branch of the line, the volumetric flow, (Q), through each branch, the outlet pressure, (P_o), at each center of distribution and the inlet pressure, (P_i), at the source of supply of gas.

The problem requires the finding of the most economical diameter of each section of the network. It is to be noted that the pressures P_1, P_2, . . . at each

$$C = \frac{tL(\alpha + \beta d + \tau d^2 P_i)}{hQ} + \frac{144 \times 14.7}{33{,}000 \times 60} = \left(c + \frac{Ut}{h} \right) \ln \frac{P_i}{P_a} + \frac{Vt}{hQ} \qquad (15)$$

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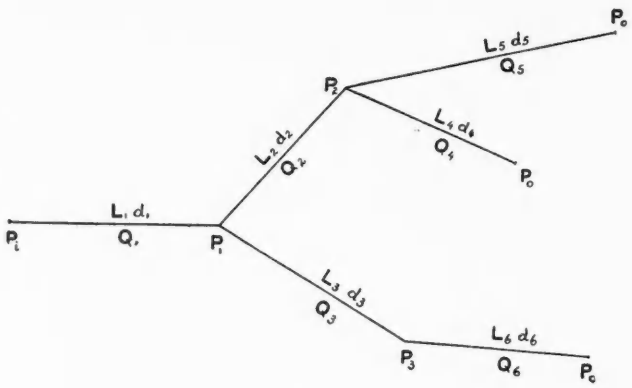


FIGURE 1B
Complex Pipe Line Distribution System

junction are not known; they must be determined in order to calculate the diameter of each section.

Weymouth's equation may now be applied to each individual section of the network and for simplicity the two members of the equation may be squared; a system of equations (the number of which is equal to the number of sections) is so obtained, as follows:

$$\left.\begin{aligned} Q_1^2 &= K^2\,\frac{d_1^{5.33}\times(P_1^2-P_1^2)}{L_1}\\ Q_2^2 &= K^2\,\frac{d_2^{5.33}\times(P_1^2-P_2^2)}{L_2}\\ Q_3^2 &= K^2\,\frac{d_3^{5.33}\times(P_1^2-P_3^2)}{L_3}\\ Q_4^2 &= K^2\,\frac{d_4^{5.33}\times(P_2^2-P_o^2)}{L_4}\\ Q_5^2 &= K^2\,\frac{d_5^{5.33}\times(P_2^2-P_o^2)}{L_5}\\ Q_6^2 &= K^2\,\frac{d_6^{5.33}\times(P_3^2-P_o^2)}{L_6} \end{aligned}\right\} \quad (16)$$

Equations 16 permit to express the diameters of each section as a function of the intermediary pressures P_1, P_2, and P_3 but these are in turn unknown and in order to find the values of the diameters other simultaneous equations must be found. It may be observed that we desire to establish a network at minimum cost and this observation will give us the necessary extra equations. The total cost of each length of the network is given by:

$$(\alpha+\beta\,d+\tau\,d^2P)L \quad (17)$$

according to equation (13).

If the total cost of the distribution system is going to be a minimum, the individual cost of each section must be a minimum. Thus

$$\frac{\partial(\alpha+\beta d_1+\tau d_1^2P_1)\,L_1}{\partial P_1^2}=\frac{\partial(\alpha+\beta d_2+\tau d_2^2P_2)\,L_2}{\partial P_2^2}=\text{- - }=0 \quad (18)$$

This gives us the equation necessary to calculate the unknowns of the problem but this system is rather complicated and in order to simplify matters, further assumptions will be made. In particular we will neglect in equation (17) the term τd^2P which is responsible for the curvature, on Figure 2, of the rate of increase of cost of the mile of pipe with increasing diameter. It is then assumed that the cost of a mile of pipe is a linear function of the diameter

$$L(A+Bd) \quad (19)$$

in which B is chosen with an appropriate value for the prevailing pressure. In other words a group of curves in Figure 2 is substituted by an average straight line. Then, equations (18) become:

$$\frac{\partial(A+Bd_1)L_1}{\partial P_1^2}=\frac{\partial(A+Bd_2)L_2}{\partial P_2^2}=\text{- - - - - }=0 \quad (20)$$

Eliminating the constants from relations (20)

$$\frac{\partial d_1L_1}{\partial P_1^2}=\frac{\partial d_2L_2}{\partial P_2^2}=\text{- - - - - }=0 \quad (21)$$

Equations (21) according to Weymouth's equation become:

$$\frac{Q_1^{\frac{2}{6.33}}L_1}{P_1^2-P_1^2}=\frac{Q_2^{\frac{2}{6.33}}L_2}{P_2^2-P_2^2}=\frac{Q_6^{\frac{2}{6.33}}L_6}{P_3^2-P_o^2}=0 \quad (22)$$

Utilizing a well known property of fractions this relation may be written

$$\left.\begin{aligned} &\frac{Q_1^{\frac{2}{6.33}}L_1}{P_1^2-P_1^2}=\frac{Q_2^{\frac{2}{6.33}}L_2}{P_1^2-P_2^2}=\text{- - - - }\frac{\Sigma Q_1^{\frac{2}{6.33}}L_1}{P_1^2-P_o^2}\\ \text{Or}\\ &\frac{a_1}{P_1^2-P_1^2}=\frac{a_2}{P_1^2-P_2^2}=\text{- - - - }\frac{\Sigma a_n}{P_1^2-P_o^2} \end{aligned}\right\} \quad (23)$$

in which a is a coefficient characterizing a section of the line, and whose value is equal to $\overline{Q^{6.33}}^{\frac{2}{}}L$.

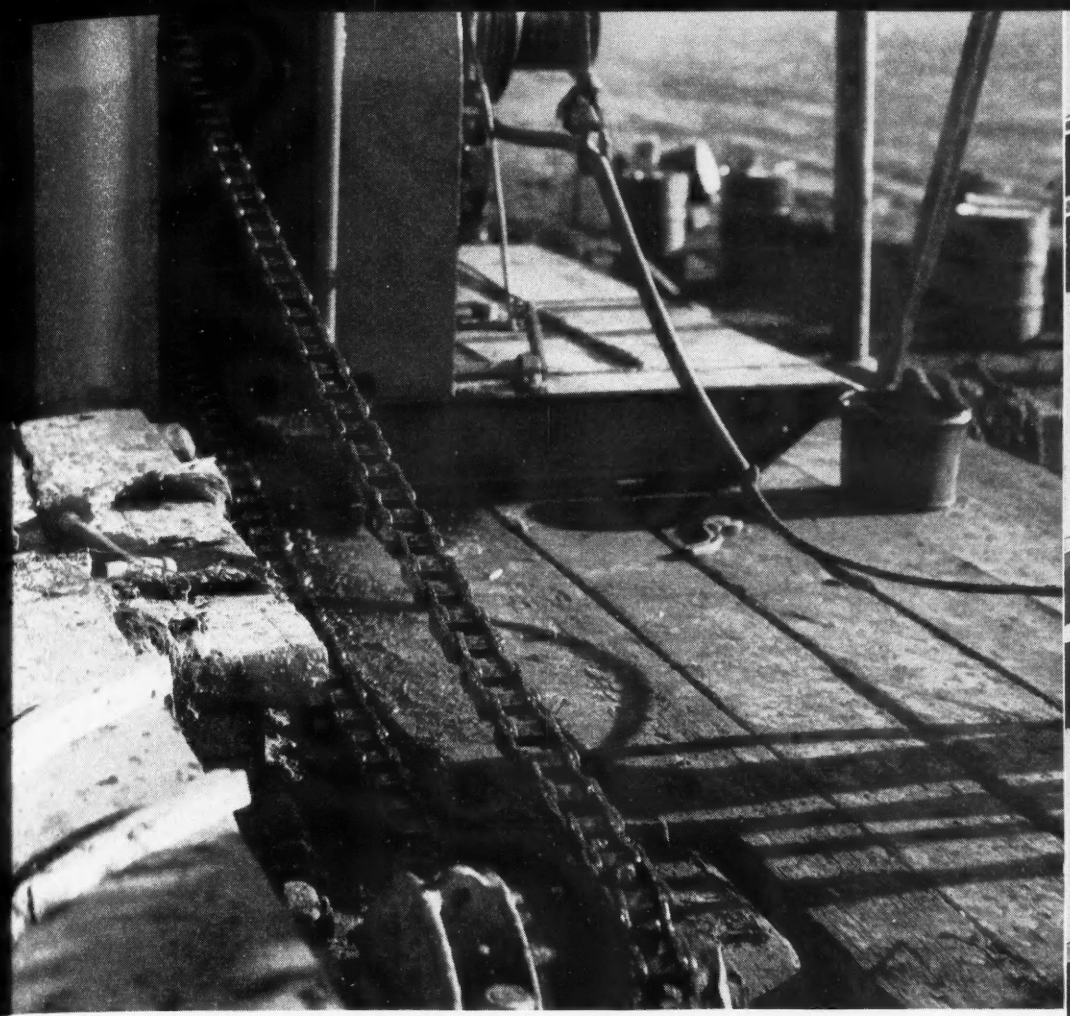
Relations (23) permit to calculate rapidly the intermediate pressures P_1, P_2 and P_3 and thereafter the diameters from the system of equation (16). The calculation for the diameters may, however, be simplified if one remarks that by substituting in (23) the values of

$$\frac{L_1}{P_1^2-P_1^2} \quad \text{by} \quad \frac{Q_1^2}{K_1^2\,D^{5.33}}$$

one obtains:

$$\frac{Q_1^2}{d_1^{6.33}}=\frac{Q_2^2}{d_2^{6.33}}=\text{- - - - } \quad (24)$$

Example I: Given the pipe line distribution system



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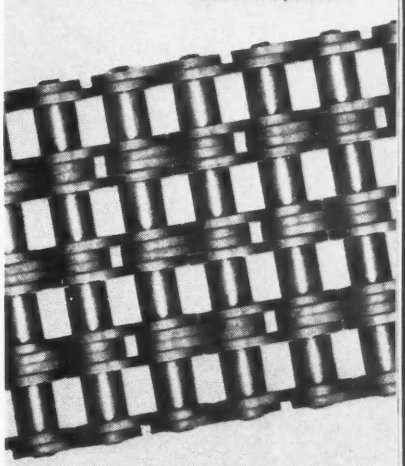

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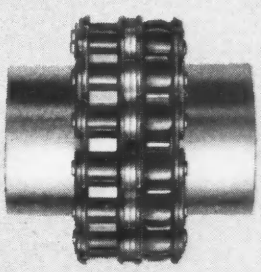

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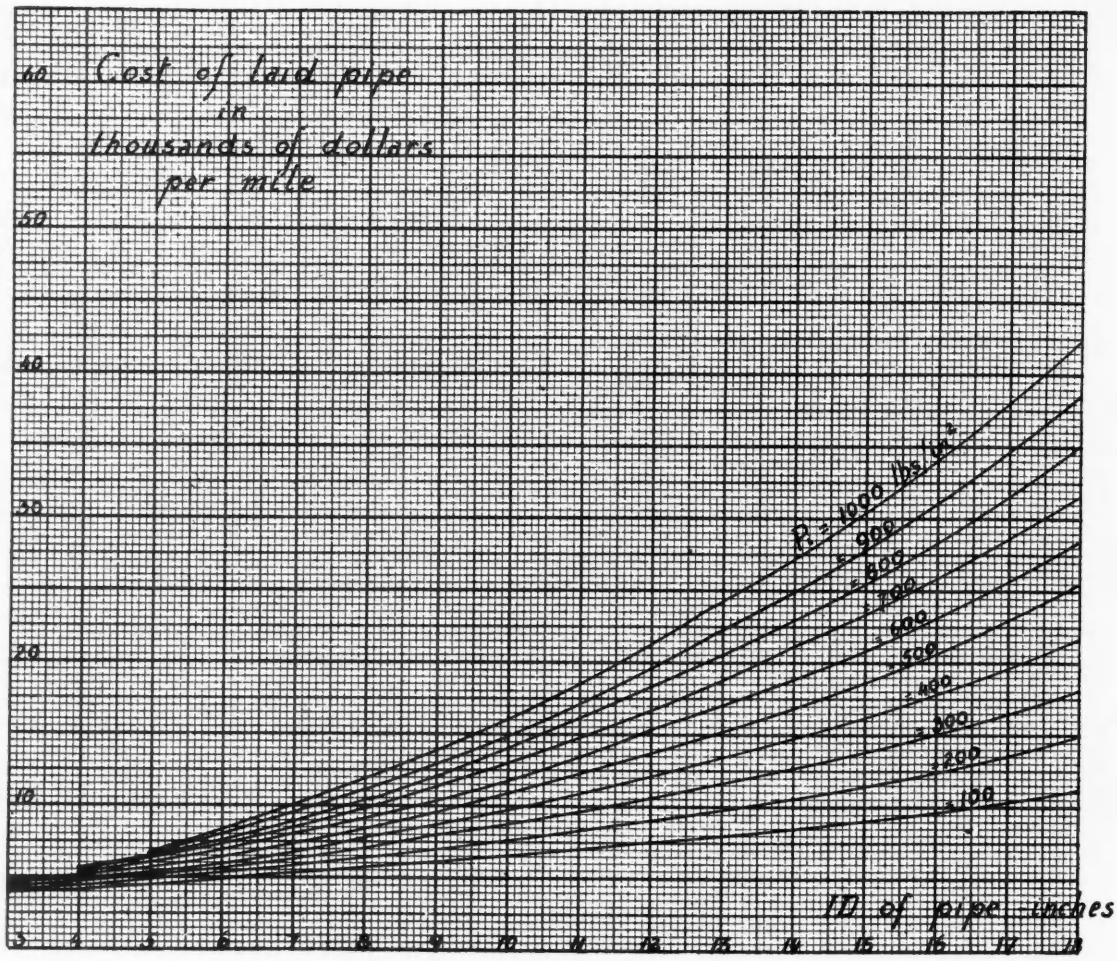

FIGURE 2
Variations of pipe line cost per mile with pressure and diameter

represented by Figure 1a and assuming the following distribution characteristics:

$P_i = 500$ lbs/in² absolute
$P_o = 50$ lbs/in² absolute
$L_1 = 10$ miles
$L_2 = 20$ miles
$L_3 = 30$ miles
$Q_1 = 1{,}000{,}000$ ft³/hour
$Q_2 = 700{,}000$ ft³/hour
$Q_3 = 300{,}000$ ft³/hour

Calculate the intermediary pressures P_1 and P_2 and the most economical diameters d_1, d_2 and d_3. Applying equation (23), one finds:

$$\frac{(1{,}000{,}000)^{\frac{2}{6.33}} \times 10}{500^{-2} - P_1^{2}} = \frac{(1{,}000{,}000)^{\frac{2}{6.33}} \times 10 + (700{,}000)^{\frac{2}{6.33}} \times 20 + (300{,}000)^{\frac{2}{6.33}} \times 30}{500^{-2} - 50^{-2}}$$

from which the value of P_1 may be calculated to be 445 lbs/in² absolute. By a similar calculation one would obtain a value of $P_2 = 326$ lbs/in² absolute. Using now the system of equations (16) and (24), the diameters of the various sections of pipe may be calculated according to the following relations:

$$(1{,}000{,}000)^2 = (34.8)^2 \frac{d_1^{5.33}(500^{-2} - 445^{-2})}{10}$$

$$(700{,}000)^2 = (34.8)^2 \frac{d_2^{5.33}(445^{-2} - 326^{-2})}{20}$$

$$(300{,}000)^2 = (34.8)^2 \frac{d_3^{5.33}(326^{-2} - 50^{-2})}{30}$$

from which the following values are obtained:

$d_1 = 9.45$ in.
$d_2 = 8.45$ in.
$d_3 = 6.50$ in.

Thus far the case of a series system as represented by Figure 1_a has been considered. In order to solve the case of a complex system as represented by Figure 1_b, further assumptions must be made. The complex system may be composed of lines in parallel, in series-parallel, and of branching systems.

If a complex system is of the series-parallel type, the problem may be solved easily provided that the parallel system may be substituted by an equivalent section. The problem is thus reduced to that of substituting equivalent sections for the parallel and the branching systems. A loop line distribution system is represented in Figure 3 in which the inlet and outlet pressures P_i and P_o are known, similarly the lengths L of the various sections are known. For simplification we will further neglect the variation of the cost of the pipe line with the square of the diameter. Thus the cost of the distribution system will remain proportional to the product of the diameter of the pipe by the length plus certain constant charges, which we may discard since their cost may not be reduced. In order that the cost of the system be a minimum it is necessary that the cost of each

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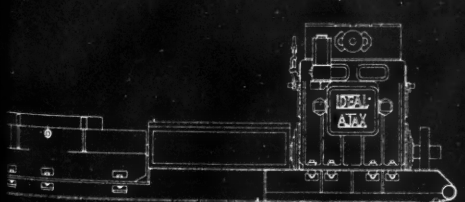

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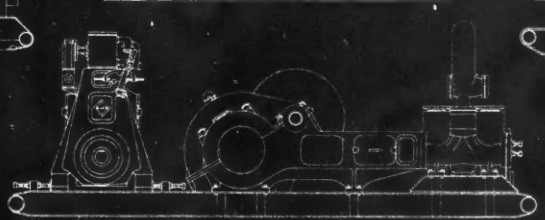

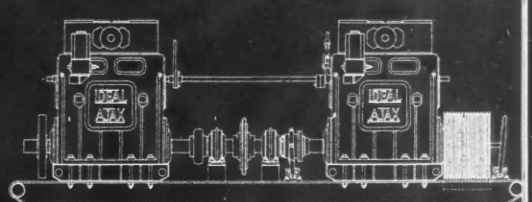

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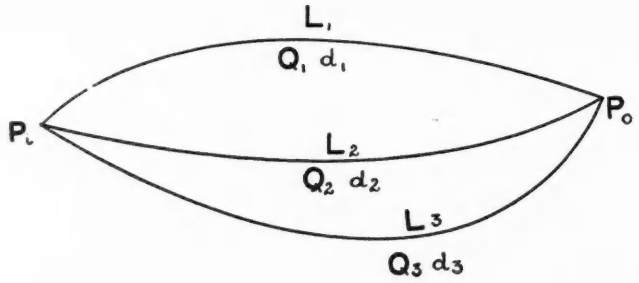

FIGURE 3
Loop Pipe Line Distribution System

section be a minimum and equations (22) are applicable to the problem of the loop system; thus equations (23) apply as well and since $P_1 = P_2 = \text{- - - - -} = P_o$ we have that the condition of minimum cost for the system is given by the relation that the coefficient, *a*, characterizing each line section should be a constant or:

$$Q_1^{\frac{2}{6.33}} L_1 = Q_2^{\frac{2}{6.33}} L_2 = Q_3^{\frac{2}{6.33}} L_3 \qquad (25)$$

Knowing the length of the various sections of the loop and the total flow, Q, to be carried, the quantity of flow through the various sections may be determined from the following equation:

$$Q_n = \frac{Q\left(\frac{1}{L_n}\right)^{\frac{6.33}{2}}}{\Sigma\left(\frac{1}{L_n}\right)^{\frac{6.33}{2}}} \qquad (26)$$

and applying Weymouth's equation, the economical diameters of the distribution lines may be calculated.

Example II: Given the pipe line distribution system represented by Figure 3 and assuming the following distribution characteristics:

$P_1 = 500$ lbs/in² absolute
$P_o = 50$ lbs. absolute
$L_1 = 30$ miles
$L_2 = 40$ miles
$L_3 = 50$ miles
$Q = 1{,}000{,}000$ ft.³/hour

Calculate the economical distribution of flow among the various lines and the economical diameters. Applying equation (26) we find:

$$Q_1 = \frac{1{,}000{,}000\left(\frac{1}{30}\right)^{\frac{6.33}{2}}}{\left(\frac{1}{30}\right)^{\frac{6.33}{2}} + \left(\frac{1}{40}\right)^{\frac{6.33}{2}} + \left(\frac{1}{50}\right)^{\frac{6.33}{2}}} = 612{,}000 \text{ ft}^3/\text{hour}$$

$Q_2 = 256{,}000$ ft³/hour
$Q_3 = 132{,}000$ ft³/hour

According to Weymouth's equation the diameters of the pipes will be:

$$d_1 = \left[\frac{(612{,}000)^2\ 30}{(34.8)^2\ (500^{-2} - 50^{-2})}\right]^{\frac{1}{5.33}} = 7.2 \text{ in.}$$

$$d_2 = \left[\frac{(256{,}000)^2\ 40}{(34.8)^2\ (500^{-2} - 50^{-2})}\right]^{\frac{1}{5.33}} = 5.5 \text{ in.}$$

$$d_3 = \left[\frac{(132{,}000)^2\ 50}{(34.8)^2\ (500^{-2} - 50^{-2})}\right]^{\frac{1}{6.33}} = 4.5 \text{ in.}$$

This indicates a rational solution as one would normally expect that the most economical solution would require the transportation of the largest quantity of gas through the shortest pipe line.

The preceding problem is somewhat unusual as the quantities of gas transmitted through the various sections of pipes of the loop are normally known quantities. In this latter case the loop problem is identical with the solution of the branching distribution system, such as represented in Figure 4.

The cost of such system is equal to the summation of the cost of the individual branches of the system. Thus:

$$\text{Total cost} = \Sigma L_n d_n = \Sigma L_n \left(\frac{Q_n^2 L_n}{P_1^2 - P_o^2}\right)^{\frac{1}{5.33}}$$

$$= \Sigma \frac{Q^{\frac{2}{5.33}} L_n^{\frac{6.33}{5.33}}}{(P_1^2 - P_o^2)^{\frac{1}{5.33}}}$$

$$= \Sigma\, a^{\frac{6.33}{5.33}} (P_1 - P_o)^{-\frac{1}{5.33}} \qquad (27)$$

Consequently the loop or the branching distribution system may be replaced by a single pipe section whose characteristic coefficient A is obtained by the following relation:

$$A^{\frac{6.33}{5.33}} = \Sigma a^{\frac{6.33}{5.33}} \qquad (28)$$

$$\text{or } A = \left(\Sigma\, a^{\frac{6.33}{5.33}}\right)^{\frac{5.33}{6.33}} \qquad (29)$$

In order to illustrate the solution of this more complex problem, the solution of the economic design of a distribution system such as represented by Figure 1_b will be worked out.

Example III: Given the pipe line distribution system represented by Figure 1_b and assuming the following distribution characteristics:

$P_1 = 500$ lbs/in² absolute
$P_o = 50$ lbs/in² absolute
$L_1 = 30$ miles
$L_2 = 40$ miles
$L_3 = 50$ miles
$L_4 = 45$ miles
$L_5 = 35$ miles
$L_6 = 25$ miles
$Q_1 = 1{,}000{,}000$ ft³/hour
$Q_2 = 600{,}000$ ft³/hour
$Q_3 = 400{,}000$ ft³/hour
$Q_4 = 200{,}000$ ft³/hour
$Q_5 = 400{,}000$ ft³/hour
$Q_6 = 300{,}000$ ft³/hour

Calculate the intermediary pressures P_1, P_2 and P_3

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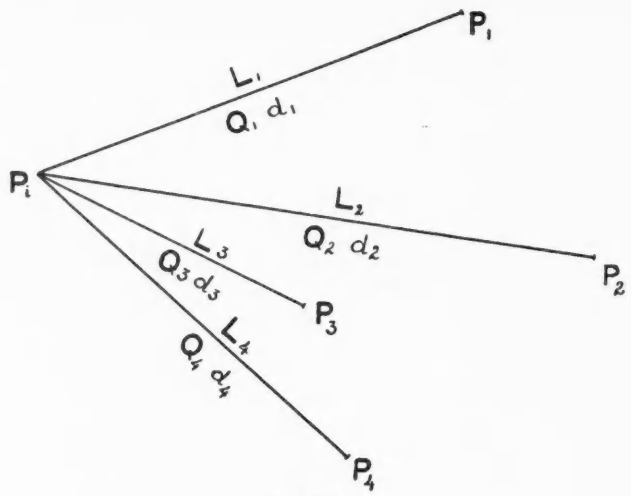


FIGURE 4
Branching Pipe Line Distribution System

and the most economical diameters d_1, d_2, d_3, d_4, d_5 and d_6.

First of all one must substitute for the distribution system between the points of pressures P_1 and P_o an equivalent single line having an equivalent characteristic coefficient.

The characteristic coefficients of all the sections will first be calculated:

$$a_1 = (1{,}000{,}000)^{\frac{2}{6.33}} 30 = 2320$$

$$a_2 = (600{,}000)^{\frac{2}{6.33}} 40 = 2670$$

$$a_3 = (400{,}000)^{\frac{2}{6.33}} 50 = 2910$$

$$a_4 = (200{,}000)^{\frac{2}{6.33}} 45 = 2360$$

$$a_5 = (400{,}000)^{\frac{2}{6.33}} 35 = 2040$$

$$a_6 = (300{,}000)^{\frac{2}{6.33}} 25 = 1340$$

According to (29), the equivalent coefficient of the two lines between P_2 and P_o is

$$A_1 = \left[(2360)^{\frac{6.33}{5.33}} + (2040)^{\frac{6.33}{5.33}} \right]^{\frac{5.33}{6.33}} = 6040$$

The equivalent coefficient for the line $P_1P_2P_o$ is equal to $A_1 + a_2 = 6040 + 2670 = 8710$ and for the line $P_1P_3P_o$ it is equal to $2910 + 1340 = 4250$. According to (29), the equivalent coefficient for the system P_1P_o is now given by:

$$A_2 = \left[(8710)^{\frac{6.33}{5.33}} + (4250)^{\frac{6.33}{5.33}} \right]^{\frac{5.33}{6.33}} = 11850$$

We are now in a position to determine the most economical value of P_i by making use of equation (23):

$$\frac{2320}{500^{-2} - P_1^{-2}} = \frac{2320 + 11850}{500^{-2} - 50^{-2}}$$

and $P_1 = 457$ lbs/in² absolute.

P_2 will be obtained from the following relation:

$$\frac{2670}{457^{-2} - P_2^{-2}} = \frac{8710}{457^{-2} - 50^{-2}} \quad ; P_2 = 350 \text{ lbs/in}^2 \text{ absolute.}$$

and P_3 will be obtained from the following relation:

$$\frac{291}{450^{-2} - P_3^{-2}} = \frac{425}{450^{-2} - 50^{-2}} \quad ; P_3 = 256 \text{ lbs/in}^2 \text{ absolute.}$$

Knowing the most economical intermediary pressures of the distribution system, the application of Weymouth's equation will give the following most economical pipe diameters for the various sections:

$d_1 = 11.6$ in.
$d_2 = 9.4$ in.
$d_3 = 8.8$ in.
$d_4 = 5.9$ in.
$d_5 = 7.25$ in.
$d_6 = 6.85$ in.

Second Problem

As the inlet pressure is not known for the second problem, the compression cost must be taken into consideration and equation (15) will express the variation of the operating cost with diameter and pressure.

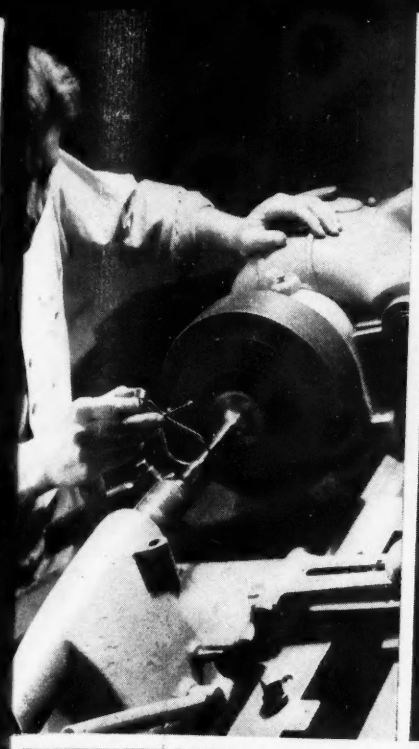
The geometry of the layout system is again known from the location of the centers of consumption. The individual requirements of each center may again be estimated as in the case of the first problem, with allowance for possible future increase in demand. The known quantities are the individual length, (L), of each branch of the distribution system, the volumetric flow, (Q), through each branch, and the outlet pressure, (P_o), at each center of distribution.

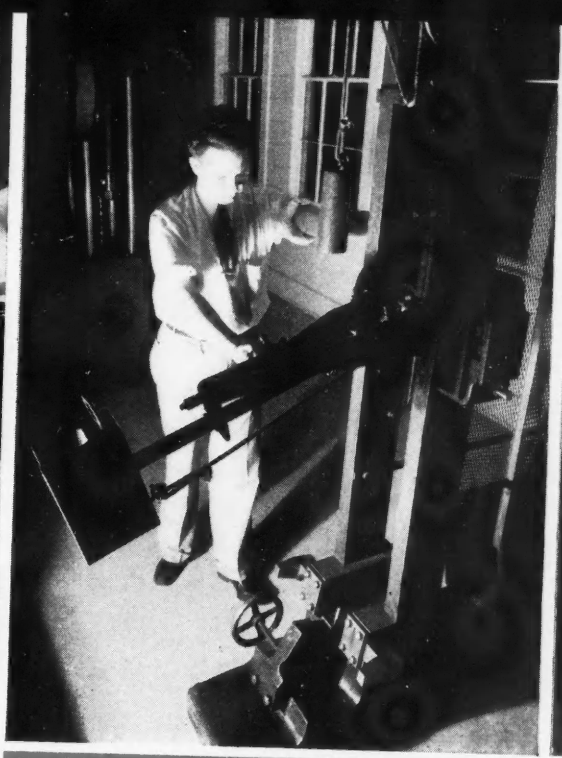
The problem requires the finding of the most economical diameter of each branch of the network as well as the most economical injection pressure.

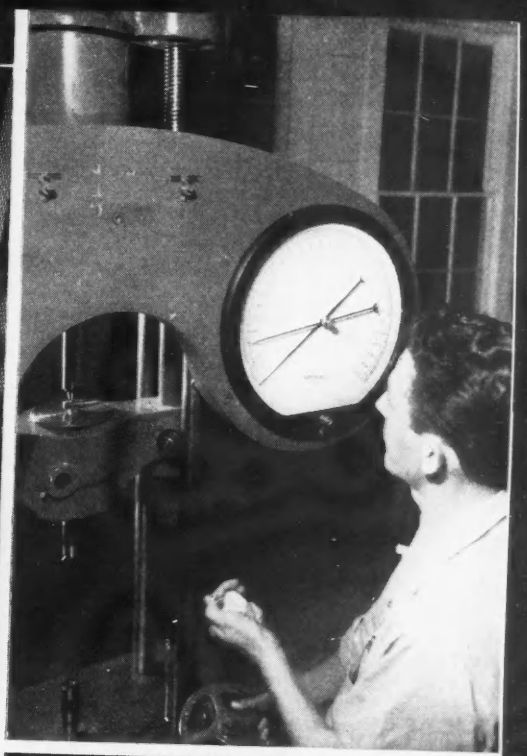
According to the preceding theory any network distribution system may be substituted by an equivalent pipe line having a characteristic coefficient, *a*, which we may suppose to be equal to the product of the maximum rate of flow elevated to the $\frac{2}{6.33}$ power and having an equivalent length, L.

$$a = Q^{\frac{2}{6.33}} L \qquad (30)$$

Weymouth's equation furnishes a relation relating







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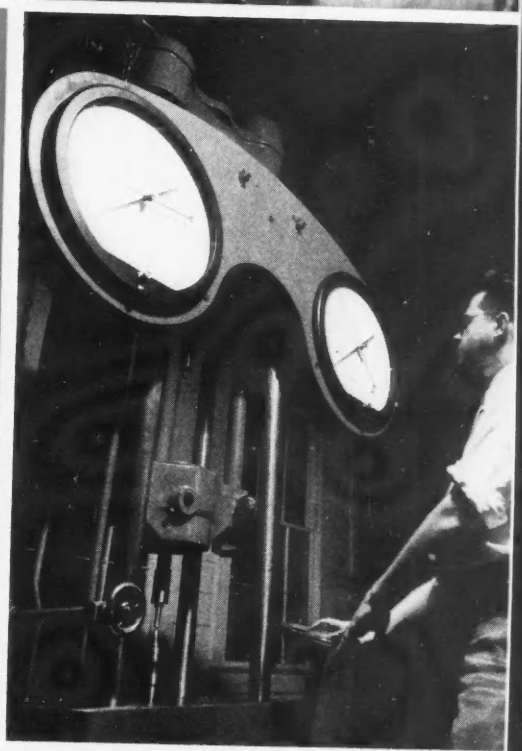

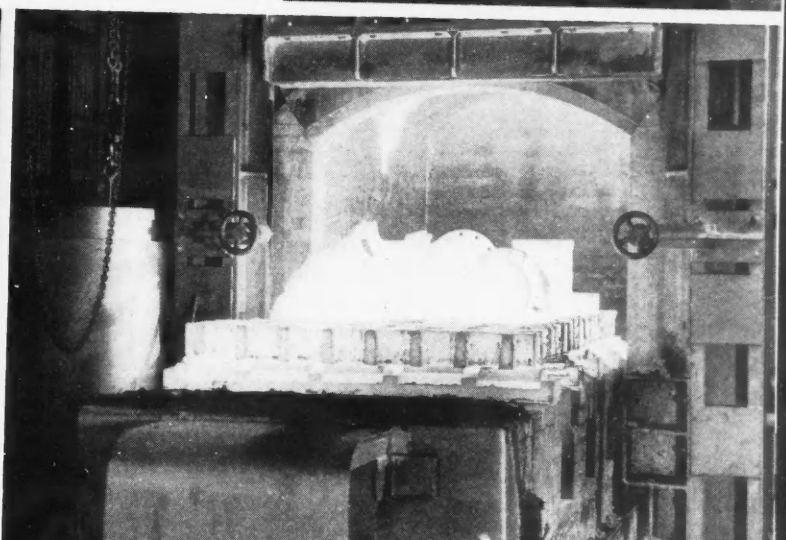

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the equivalent diameter d and the inlet pressure P_1, which are two unknowns of the problem:

$$Q^2 = K^2 \frac{(P_1^2 - P_o^2)\, d^{5.33}}{L} \qquad (31)$$

A third relation is necessary in order to obtain the value of the injection pressure. This will be found by the consideration that the operating and financial charges of the line must be a minimum. The costs of operating a gas transmission line are given by equation (15) in which, for the sake of simplification, we shall neglect the term $\pi d^2 P_1$, which is responsible for the curvature of the lines on Figure 2. Substituting the values of L and d as obtained from (30) and (31), the expression of the pipe line operating cost becomes:

$$C = \frac{t\,a}{h Q^{\frac{5.33}{6.33}}} \left[\alpha + \beta \frac{Q^{\frac{2}{38.8}}\, a^{\frac{1}{5.33}}}{K^{\frac{2}{5.33}} (P_1^2 - P_o^2)^{\frac{1}{5.33}}} \right] + \frac{144 \times 14.7}{33{,}000 \times 60} \left(c + \frac{Ut}{h} \right) \ln \frac{P_1}{P_a} + \frac{Vt}{hQ} \qquad (32)$$

This equation contains but one variable, P_1, and the expression of the cost must be a minimum for the most economical operation. Taking the derivative of (32) with respect to P_1 and equating to zero gives us a means of calculating the most economical injection pressure:

$$\frac{P_1^2}{(P_1^2 - P_o^2)^{\frac{6.33}{5.33}}} = .01805 \left(c + \frac{Ut}{h} \right) \frac{h\,Q}{t\,\beta\, a^{\frac{6.33}{5.33}}} \qquad (33)$$

This relation is really quite complicated and may be solved most conveniently by successive approximations assuming various values for the inlet pressure P_1. The meaning of the various symbols will be repeated here for convenience:

- P_o: the outlet pressure at the various centers of consumption
- C: the cost of the unit of energy used for driving the compressors
- U: the cost of the compressor per horse-power
- t: the daily interest rate on invested capital
- P_a: the inlet pressure to the compressors
- h: the average number of hours of utilization per day
- Q: the total volumetric flow through the compressor per hour
- β: a constant equal to about 260
- a: the characteristic coefficient equivalent to the distribution network.

Having obtained the best value for the inlet pressure P_1 by means of equation (33) the solution of the problem at hand is in all respects similar to the solution of the previous problem.

Example IV: Given the pipe line distribution system represented by Figure 1_b and assuming the same distribution characteristics as in Example III, calculate the most economical inlet pressure, the symbols in equation (33) having the following values:

- U = \$125 per H.P.
- c = \$ .0025 per H.P. hour
- t = \$ .000384 per day per dollar
- P_o = 50 lbs/in² absolute
- β = 260
- a = 11850 + 2320 = 14170 (according to results obtained in example III)
- h = 10

Equation (33) now becomes

$$\frac{P_1^2}{(P_1^2 - P_o^2)^{\frac{6.33}{5.33}}} = .0915$$

As a first approximation it will be considered that P_0^2 is negligible with respect to P_1^2 and the solution for the most economical pressure P_1 is obtained by:

$$P_1^{\frac{2}{5.33}} = \frac{1}{.0915}$$

which gives P_1 = 590 lbs/in² absolute.

In view of the fact that $P_o^2 = 2500$ is a very small fraction of $P_1^2 = 350{,}000$ it may be considered that this first approximation for the most economical injection pressure is sufficiently accurate. For low pressure transmission lines a solution of equation (33) will have to be obtained by successive cuts and tries as P_o^2 may not be considered negligible with respect to P_1^2.

The calculation may now be conducted as under problem III in order to determine the most economical intermediary pressures P_1, P_2 and P_3 and the most economical diameters of the individual line sections.

Conclusions

It is interesting to consider equation (33) giving the variables which affect the value of the most economical injection pressure:

1. The most economical injection pressure decreases, other variables remaining constant, when the rate of interest on the invested capital decreases.

2. The most economical injection pressure decreases when the cost of the unit of energy and the coefficient of utilization of the transmission line are separately or simultaneously increasing.

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[4] T. W. Johnson and W. B. Berwald, Flow of natural gas through high pressure transmission lines, (Appendix I, pp. 86-92), U.S.B.M. Monograph 6.

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Hittle Pool Is Outstanding in Recent Kansas Development

By FRANK TAYLOR, Staff Writer

LEADING the front rank of Kansas discoveries during the past 18 months, Hittle pool of Cowley County continues its position of prominence. Production was opened as a result of a deeper test on a structure already producing from the Layton sand section of Kansas City lime. The test completed in Arbuckle lime to earn a flowing potential of 1220 barrels. Subsequent drilling gave the field the two largest producers in Kansas, one of 22,000 and one of 17,508 barrels potential, flowing.

Hittle pool is in an area of early activity that centered about Winfield, 17 miles north of the Oklahoma line and the same distance east of Range 1. The pool is yet to be defined in most directions. While major exploratory activity continues along Central Kansas Uplift, the new field emphasizes the opinion of a number of geologists that the southeast section of the state might contribute important new fields if tests were properly located. With the swing of activity to more westerly trends, Cowley and adjacent counties, with few exceptions, have been somewhat dormant. But the new strike renewed interest in this area of past development.

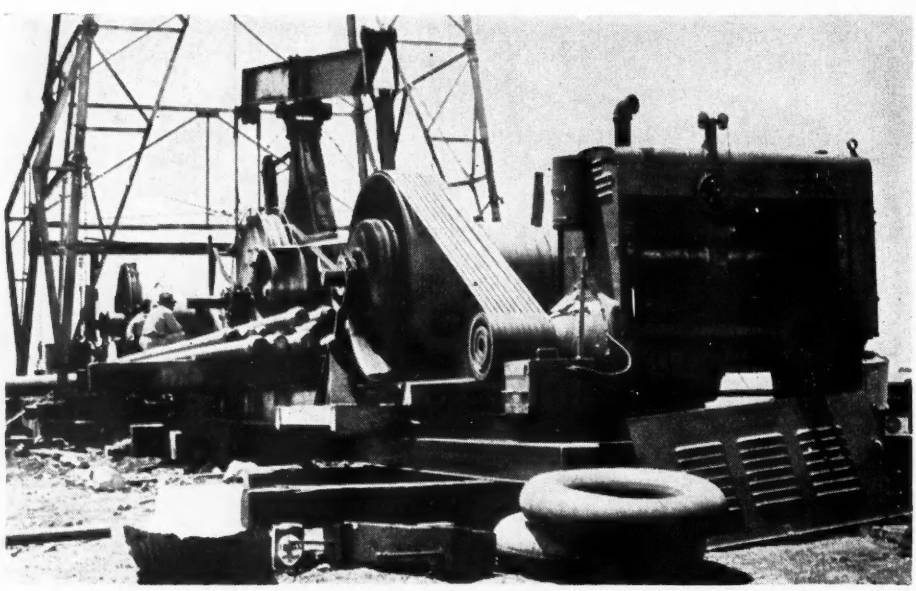
The field now includes 30 wells producing from Arbuckle, 8 from Layton sand, sandy section of Kansas City lime. Of Layton wells drilled following discovery of production in this pay by Trees Oil Company 12 years ago, 4 have been plugged and 4 have been deepened. To May 1, 1939, accumulative production totals 737,726 barrels from 17 wells in Arbuckle lime, Layton production being minor and not included. Two pipe lines have connections in the field—Sinclair Refining Company and Kanotex Refining Company.

The discovery well in Hittle Arbuckle was drilled by McKnab & Blair, Hittle 1, SW SE NE 21-31s-4e, in October, 1937, cable tools being used. Top of Arbuckle lime (Siliceous) was had at 3279 feet and hole was carried only 5 feet into the formation through continuous saturation. Initial flowing potential of 1220 barrels was given the test although the operators deepened the well 4 feet to 3288 feet, September 28, 1938, and increased the potential to 1643 barrels.

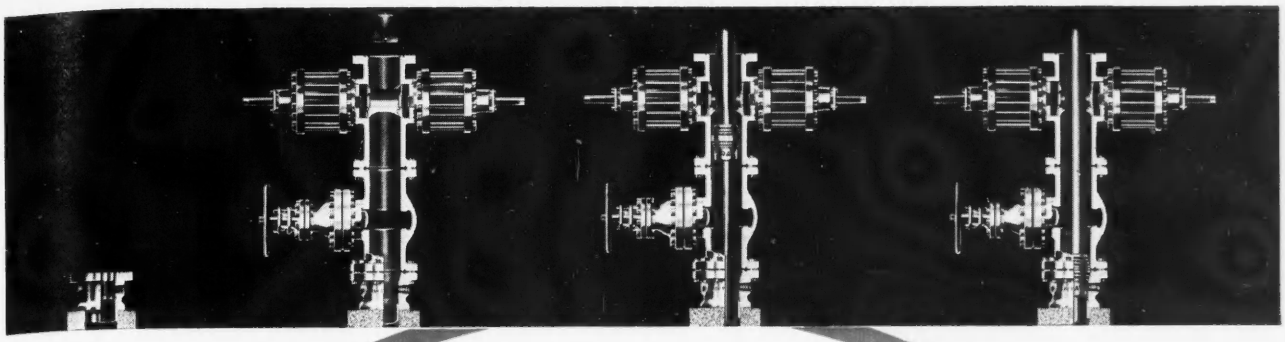
The Texas Company and Trees Oil Company drilled immediately succeeding wells and development has since been steady with as many as 6 and 7 rigs in operation. Major leaseholders in the proven area of the field are Trees Oil Company, Tulsa Oil Corporation, Cities Service Oil Company, The Texas Company, Hartman & Blair, Barnett & Connelly, and Arthur Brewer. Some of the above independents have unitized holdings.

Development and Geology

After completion of the discovery well in Section 21, drilled as a twin to an abandoned Kansas City producer, The Texas Company drilled Hittle 6, also a twin to a shallow producer and a direct south offset to the McKnab discovery. The third well to complete was Trees Oil Company's Lewis 3, NE NW NE Section 28. The test went to 3333 feet in Arbuckle from former bottom of 2500 feet in Kan-



McKnab and Tulsa Oil Corporation's Waite 1 on potential test pumping 54-inch stroke, 36 strokes per minute. Well is rated at 6521 barrels.



1 CASING HEAD ATTACHED WHILE CASING IS CEMENTED

2 DRILLING

3 RUNNING CASING

4 CASING LANDED AND CEMENTED

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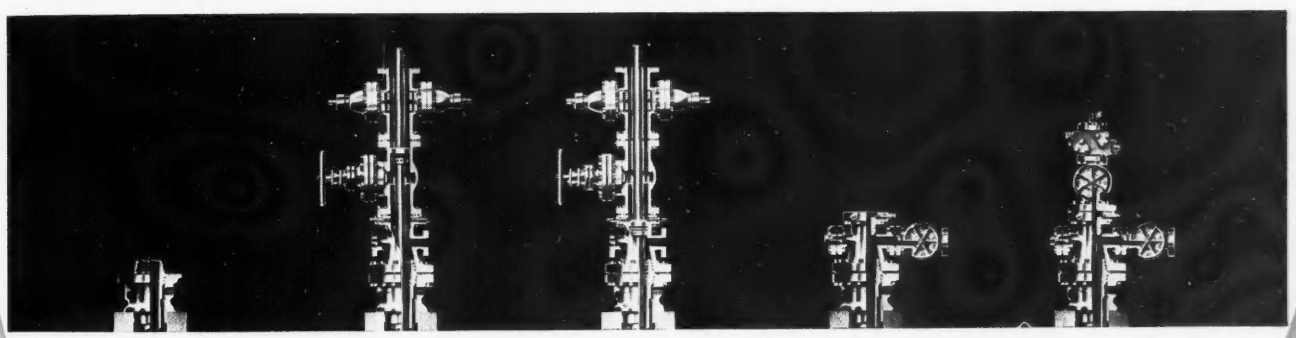

5 DRILLING CONTROL EQUIPMENT REMOVED WHILE CEMENT IS SETTING

6 DRILLING-IN AND RUNNING TUBING

7 TUBING LANDED

8 CONTROL EQUIPMENT REMOVED

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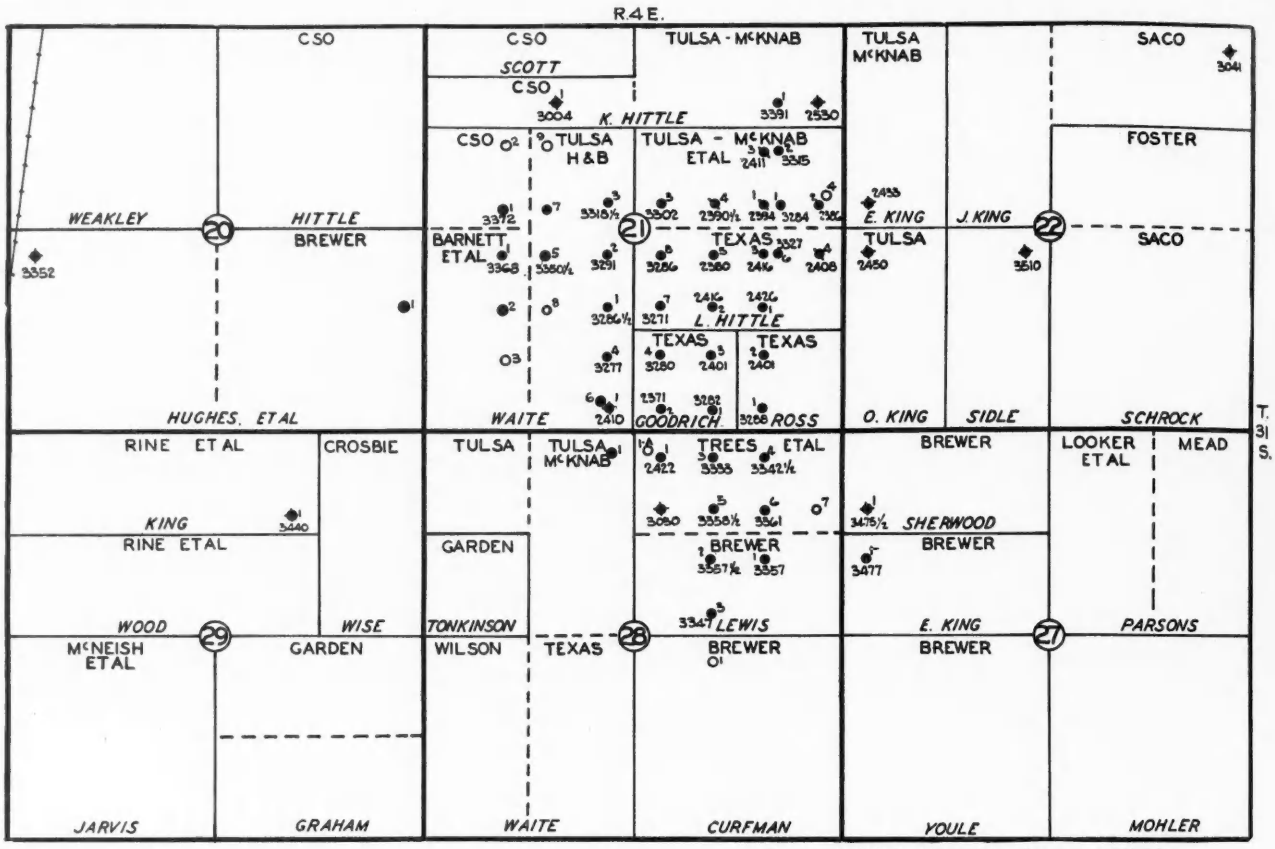

Courtesy, Mid-Continent Map Company, Wichita.

Hittle pool has witnessed rapid drilling since completion of the well in Arbuckle on May 26, 1938. Originally producing from Layton sand from 2350 to 2450 feet since proving of the structure 12 years ago, the field now boasts the largest producer in Kansas. The two productive formations are identified on the map by indicated depths, mean Arbuckle datum being 3325 feet.

sas City to rate a pumping potential of 2296 barrels. This latter completion was made a half mile south and one location west of The Texas Company's Hittle 6, indicating an Arbuckle structure conforming roughly with Layton sand production. This, and the high potentials, gave the impetus necessary to subsequent development.

Extensioners followed rapidly to push the boundaries of the field to the west and south of the discovery, with the major share of drilling confined to the area of Layton production. At the south end of the field, Arthur Brewer's Lewis 3, SE SW NE Section 28, found top of Arbuckle less than 20 feet lower than the discovery and completed for 1912 barrels, to indicate future drilling to the south and west and possibly 2 locations east. A test on the southwest edge of the field, McKnab's Waite 1, NE NE NW Section 28, made potential of more than 6000 barrels to keep the pool open in that direction. The field is open to the north with tests now drilling north offsets to production.

Limiting possible expansion are 5 wells. To the west of the field, on a spot only 3 locations west and 2 south of the pool's largest well, Arthur Brewer's Hughes 1, SE NE SE Section 20, made a potential of only 72 barrels from Arbuckle after finding the pay 30 feet lower than nearest production. To the southwest, in NE Section 29, ½ mile from present limits of the field, Rine et al's King 1 was abandoned at 3440 feet after coring poor porosity in Arbuckle. To the north of the field there are no failures in Arbuckle although 2 Layton tests were completed dry, indicating but not establishing a structural dip in that direction. In any case, drilling to this time has proven the Arbuckle structure larger than the Layton. This leaves major extensions possible to the south, southwest and north of the present pool.

Both Arbuckle and Layton wells give evidence that the field is sharply defined to the east, north and south along the east line of Sections 20 and 21. Two Layton failures were drilled as east offsets to production, the producers being in Section 21 and the failures in 22. Also, a test to 3500 feet near the center of Section 22 failed to find shows in any formation and checked low from the first marker.

Directly south of the Layton failures in Section 22, Arthur Brewer drilled Sherwood 1, SW NW NW Section 27 to 3475 feet without production, and as a south offset to this well drilled King 1, NW SW NW Section 27 to 3478 feet and plugged back to 3476 feet. From what is considered Misener formation, King 1 obtained a potential of 344 barrels, the crude being slightly different in character from that produced in the heart of the pool. These 2 wells, although only 2 locations east of completed producers, are between 70 and 80 feet low on Arbuckle. Due to structural sharpness west offsets may be productive.

As developed to the present extent, Hittle field encloses 600 productive acres. In addition, 250 acres should be productive in light of present information. Forty-three locations not now in the completion list are considered proven. Of these, some are drilling and others are scheduled for the near future.

Geological information on the field developed as completions were added, this data being correlated to prior knowledge of the

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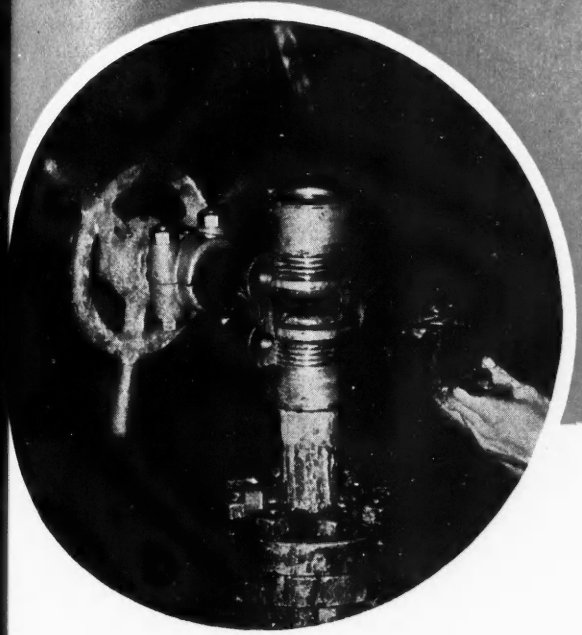

Left—The resilient flow-way insert may be replaced quickly and easily by simply releasing the four body bolts and dropping the lower half of the body.

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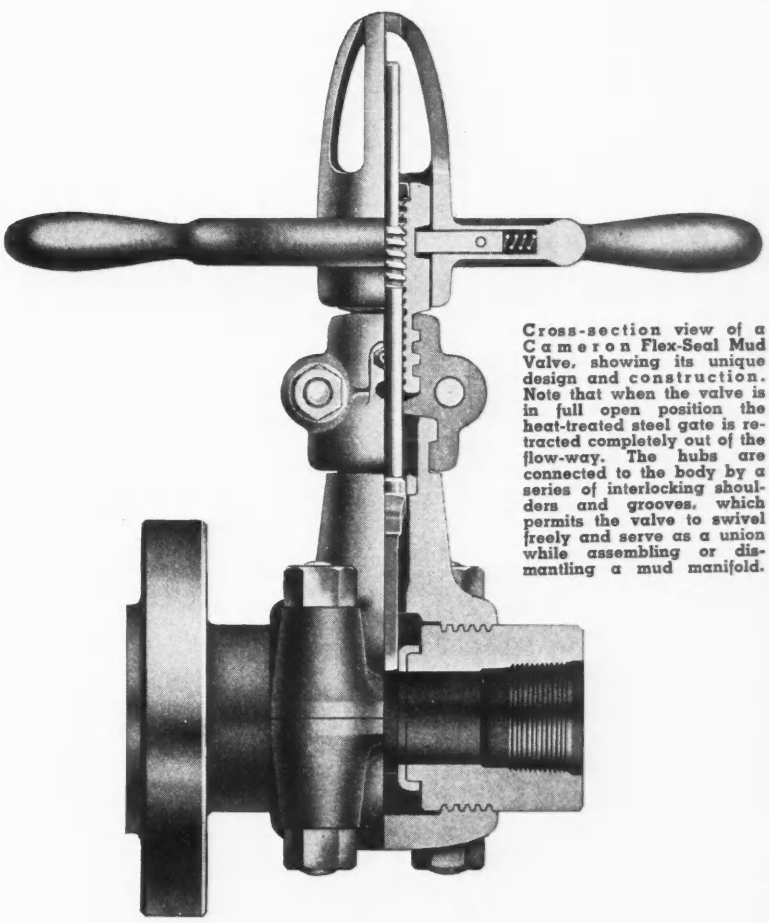

Cross-section view of a Cameron Flex-Seal Mud Valve, showing its unique design and construction. Note that when the valve is in full open position the heat-treated steel gate is retracted completely out of the flow-way. The hubs are connected to the body by a series of interlocking shoulders and grooves, which permits the valve to swivel freely and serve as a union while assembling or dismantling a mud manifold.

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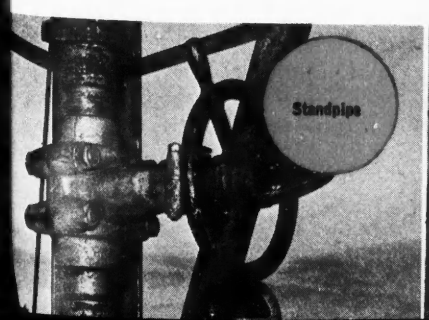
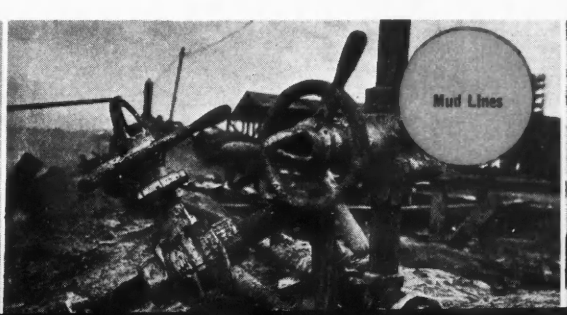
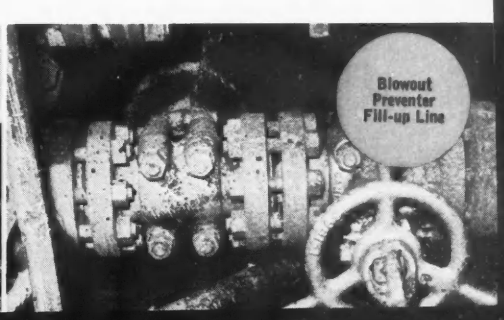
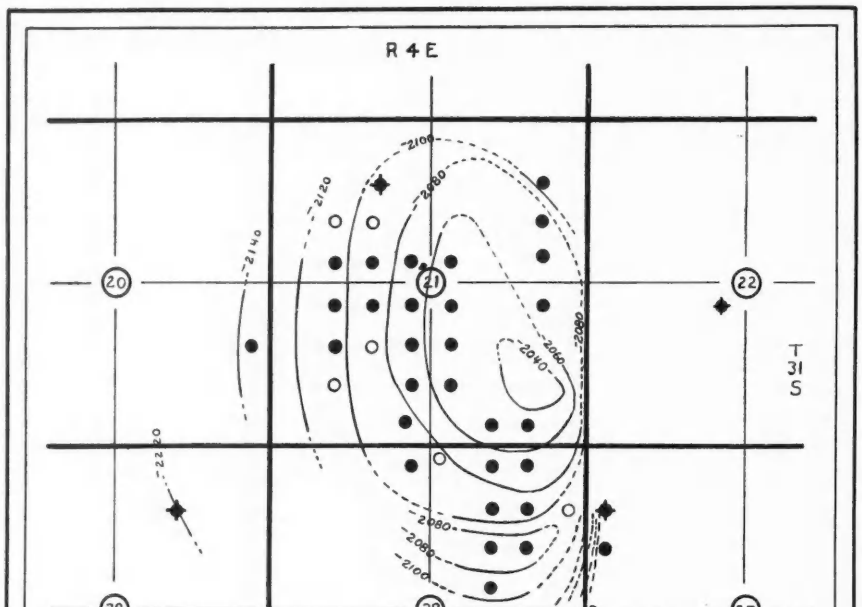








Subsurface contour in Hittle pool, top Arbuckle lime at 20-foot intervals.

pool gained through shallow drilling and to geological information general to the area. Weathered field, 7 miles southwest of Hittle, is productive in Arbuckle, the structure being sharp. South David and David, northeast of Hittle, produce from Burbank. Shallow sands and limes, where having sufficient closure, are generally productive.

The majority of structures in the area point to two lines of folding, one northwest-southeast and the other northeast - southwest, with the most pronounced lines of stress paralleling Nemaha Ridge which angles through the northwest corner of the county. A general west dip prevails through surface formations. Granite nosings are present in the county, with Arbuckle unconformative below Mississippian. Post-Mississippian folding is reflected in Pennsylvanian beds and on the surface, indicating structural characteristics to and including Mississippi lime, but not necessarily including Arbuckle.

The possibility that the field's discovery may indicate an Arbuckle trend must be discounted in view of the unconformative Mississippian-Arbuckle contact. Hittle field, an anticline, characterizes normal Post-Mississippian folding and is concluded to be sharply defined on the east. More than anything else, Hittle points to possibilities of finding Arbuckle production in fields of the area now producing from more shallow pays, where the accumulation is anticlinal.

The Arbuckle lime shows characteristic dolomitization in the first few feet of the pay. This formation is more naturally a dolomite than a true lime, but in the top of the Hittle pay the percentage of magnesium in the calcium-magnesium carbonate is believed higher than average. This reformation of the carbonate compounds produced a physical change in the texture of the lime through recrystallization, and greatly increased the normal porosity of the formation. A study of the lime in Hittle pool in order to establish detailed strata information is in progress.

Because of the condition of Arbuckle lime at and near the top, wells are only drilled 4 to 15 feet into the pay. Below these depths the dolomitic section graduates into tight lime. The upper section is sugary dolomite, highly porous and saturated but as hard to cut as the underlying lime which is of low porosity and without saturation.

Drilling and Completion

Drilling in Hittle is by both cable and rotary equipment, with the latter predominating. Rotary time to top of the pay averages about 15 days, with most wells being completed with cable tools. Cable time through completion is about 40 days. Costs of completing the average well, including labor, cement, casing, fuel, etc., with tanks and surface connections, runs to $17,000. Contract price is $12,000 to $12,500, plus cement, tankage, pipe strings, etc. The custom is to set from 80 to 150 feet of surface pipe in rotary wells with 7- and at times 6-inch for an oil string.

Cable tool operations encounter no difficulty. In these the usual casing string is as follows: 400 feet of 15½-inch surface pipe, 1200 feet of 12½-inch, 1800 feet of 10-inch, 2100 feet of 8-inch, with either 6-inch into the pay or 2700 feet of 6-inch and 3300 feet of 5-inch. Operators vary this program to suit individual requirements.

Diesel, natural gas and gasoline rigs are in operation in the field. Although there are no major difficulties experienced in making hole, formations are harder than in the average Kansas field. There is no trouble with water-bearing formations and only a little gas in Arbuckle found in solution with the crude. A shallow gravel water stratum at 60-80 feet is cased off with surface pipe. Nine-inch hole is carried with rock bits being used all the way. Mud weight is 10.5 pounds.

The markers watched for are Layton at 2400 to 2500 feet and Mississippi lime. Lime and shale predominate, with a hard section 800 feet thick directly below the surface. From this depth to Layton sand, drilling is easiest, but here the formations harden and continue so to total depth. Mississippi lime is the most difficult formation to penetrate.

The practice of operators is to drill to top of pay with initial equipment, and if rotary is used, a cable string is moved in to drill into the pay and complete. Being porous and carrying saturation only in the few upper feet, the Arbuckle lime is not cut more than 15 feet. There is no gas cap in the lime, nor water under the produc-

Tank Heater in Big Muddy Field Arranged for Economy

HAVING part of the original productive part of the Big Muddy field, near Glenrock, Wyoming, and acquiring leases originally drilled by other companies, Continental Oil Company rearranged lease batteries, and concentrated tanks in one location to simplify operation and to eliminate a large number of boilers which are used for heating the oil.

As the pool lies along the south bank of the Platte River, the ground naturally slopes to the north, with sufficient fall that drainage is no problem, and makes it possible in many installations to place the boiler below the tank battery grade. When such conditions are available, a syphon system of heating is employed whereby the condensate from heating steam is returned to the boiler without the necessity for pumps.

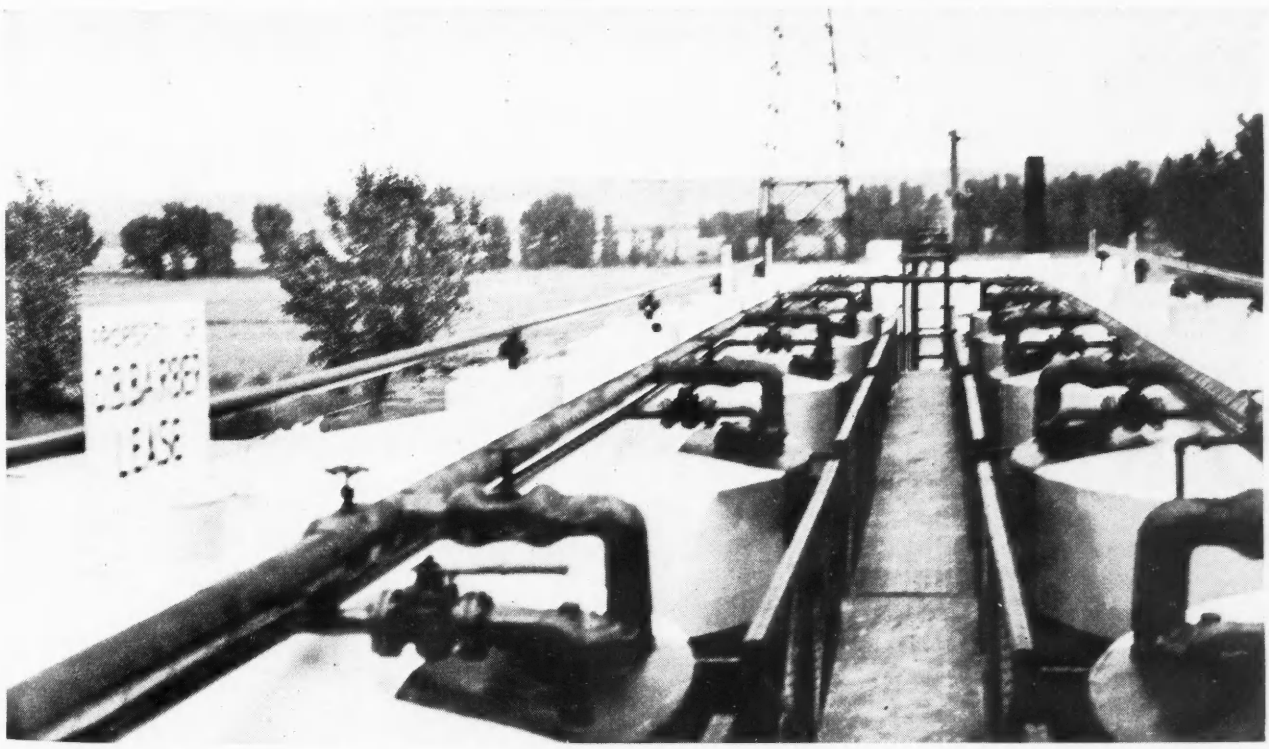
The tank batteries are arranged in two rows, using as many vessels as required to handle production from a number of separate leases, each pair of which, or more is necessary, have individual flow lines and connected separately to pipe line pumping equipment. This arrangement provides the same individual facilities as when the tanks were located on the leases separately. The tanks are welded vessels with vapor-tight hatches and bolted manholes, having vapor lines extending to vents for protection from fires.

For heating the oil, each row of tanks has its separate steam line running above the roofs, with control valves placed in convenient position for lease men to operate them from the safety walk-way between the two rows of tanks. Each tank is equipped with a pipe coil for heating with the steam flowing through the insulated header, with the amount of steam admitted to each tank controlled by the valves on the branch lines connected to the heating coils. The heating system is a closed one, with the coil outlets attached to a common condensate line which leads back to the boiler.

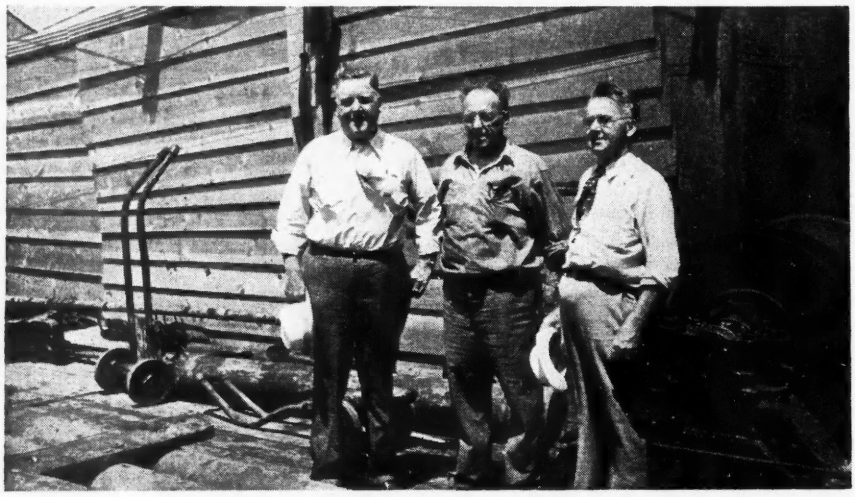
Where feasible, the boiler is set below the tank battery grade to facilitate flow of condensate from the coil header without the need of a hot well and boiler feed pump.

Gas is produced from wells and tank batteries in sufficient volume to furnish fuel for pumping wells and for boiler fuel, and each boiler has a steam pressure controller on the fuel line. The pressure maintained on the heating boiler is the amount necessary to control temperatures within the tanks, but never exceeds a few pounds. Each boiler house is constructed of corrugated iron, but is protected from the winter chill by a ceiled interior, with adequate ventilation and large doors for moving equipment and supplies in and out.

In operation, the lease man attends to filling the boiler with the required amount of water and adjusts the fires to produce the desired temperature and volume of heating steam to condition the oil in the tank batteries. As the steam flows from the dome connection through the insulated distribution lines and is admitted to the heating coils, the condensate forming flows outward to the header and enters the shell of the boiler by gravity and under equalized boiler pressure.



A battery of flow tanks used by Continental Oil Company in the Big Muddy field, near Glenrock, Wyoming, in the rehabilitation of leases in that area.



Paul, Charles and Clyde Trees, from left to right, pardners in acreage development in Hittle field, Kansas. The brothers have been together in the oil industry 35 years and each has more than 40 years to his credit after starting in West Virginia fields.

tion. Pressure is a little over 1300 pounds per square inch. Due to the high porosity of the pay formation, and its capacity to release the crude rapidly, all completions are made as natural producers.

Production-Potentials-Pipe Lines

All wells in the field flow their production naturally with but one exception, this being Arthur Brewer's Hughes 1 in Section 20, westernmost producer of the field. This well found the Arbuckle low and made only 72 barrels on potential test. Rigs are moved from location soon after completion. Surface connections are simple with control head, production control valve and check. Tankage is of batteries of 2 to 4 500-barrel tanks.

Crude from the Arbuckle in Hittle is produced as pipe line oil, checking 38.5 to 39 degrees, A.P.I., at 60 degrees temperature. Oil as it comes from the wells is 72° F. Compared with other Arbuckle lime production, the crude carries very little sulphur. Lack of bottom water in the reservoir has eliminated a disposal problem. Although the Arbuckle dolomite normally carries little gas with its crude, Hittle field shows for slightly more than average gas volumes despite the lack of any gas cap, produced gas being entrained in solution and coming out with drop in pressure. There is some paraffin with the crude but not sufficient to cause concern during warmer weather. During the winter months, tankage showed some paraffin bottoms.

Potential as of June 15, 1939, rose to approximately 160,000 barrels to give the pool a daily allowable of about 2950 barrels based upon the new percentage figure adjusted at the Winfield meeting of operators held June 8. The former allowable percentage was 2.1 percent of potentials, the new being a decrease of .25 percent.

Potentials are taken on the majority of completions by pumping through not larger than 3-inch tubing pump in 3-inch tubing, or by the use of a 3-inch casing pump. Length of stroke by either method is limited to 54 inches with strokes per minute limited to equipment. Four potentials have been taken in the field through the use of bottom-hole bomb with the well producing through 3-inch tubing. By establishing a productivity index of the well, basing this on relative tubing and casing pressures to various stabilized rates of flow, the potential capacity of the well is ascertained. This test is for 8 hours, and the tests with pumping equipment are made for the same duration of time, total production at the end of the last hour being multiplied by three to equal the potential in all pumping tests.

Bottom hole pressure bomb used on following wells to establish indicated potentials:

Cities Service Oil Company's Waite 1.. 8,258
Barnett & Connelly's Waite 2..... 8,623
Barnett & Connelly's Waite 1.....17,508
Hartman & Blair's Waite 7..22,000 to 25,000*

*After adjusting the potential of Waite 7 from an indicated 36,000 barrel capacity to between 22,000 and 25,000, the completion ranks as Kansas' largest well.

Outlet to the production of the field is through two pipe lines, with well connections about evenly divided. Sinclair Refining Company has a station in the southwest of Section 21, capable of handling 150 barrels per hour through 1½ miles of 3-inch into 4-inch to Gordon station on the main line Crude for Kanotex Refinery at Arkansas City is pumped through a station in the same quarter-section, discharge being into a 4-inch outlet. Both pump stations incorporate direct-connected, internal combustion powers, one using natural gas and the other crude oil for fuel, both discharging at about 350 pounds pressure.

* * * * * *

Four years ago Kansas operators found renewed interest in the eastern section of the state, and applied new prospective means to the search for fields that were passed up in past years of development. New maps were drawn of both Arbuckle and post-Mississippian features and trends. In light of new knowledge of conditions, supplemented by facts previously established, a number of new pools in the deeper formations and shoestrings in the more shallow have been located, with Hittle pool the most outstanding.

In addition to the probability that important reserves were passed up in the first rush of activity, the eastern section of the state offers more ready market to crude than does the western sector. In Kansas this is vital to the operator, and makes it desirable to locate tests within or adjacent to an area already served by pipe lines. The eastern area affords this advantage, whereas the western sector, particularly in wildcat territory, does not. Crude oil in the eastern part of the state is desirable as to quality except in a very few of the "grass-root" shoestrings.

Recoveries are high from both sand and lime formations, and the area includes some of the richest productive acres in the Mid-Continent. Arbuckle lime is the goal of much of present deep prospecting, and usually recovers some 5000 to 8000 barrels to the acre. El Dorado and Augusta fields greatly surpassed these figures. Hittle pool, though indicated to be smaller in extent than either of these, is expected to show relatively high ultimate recoveries with the majority of operators setting the minimum at 12,000 barrels per acre. There is not sufficient data available upon which to base an estimation of reserves. The section of productive Arbuckle is highly porous, does not carry bottom water, and has 5 to 18 feet of saturation. The small amount of gas cannot allow much reservoir energy from this source but the pool shows evidence of having an active water drive.

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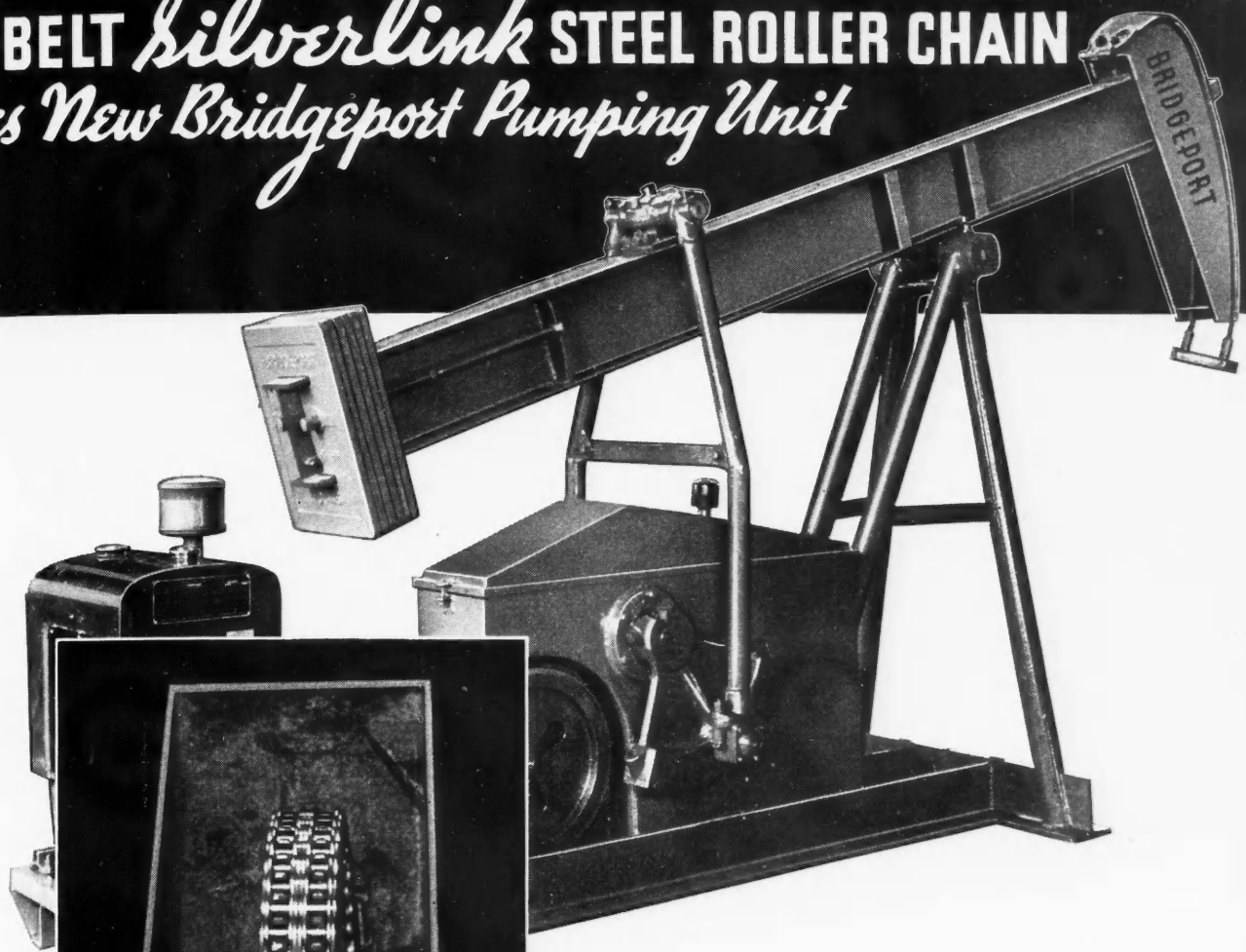
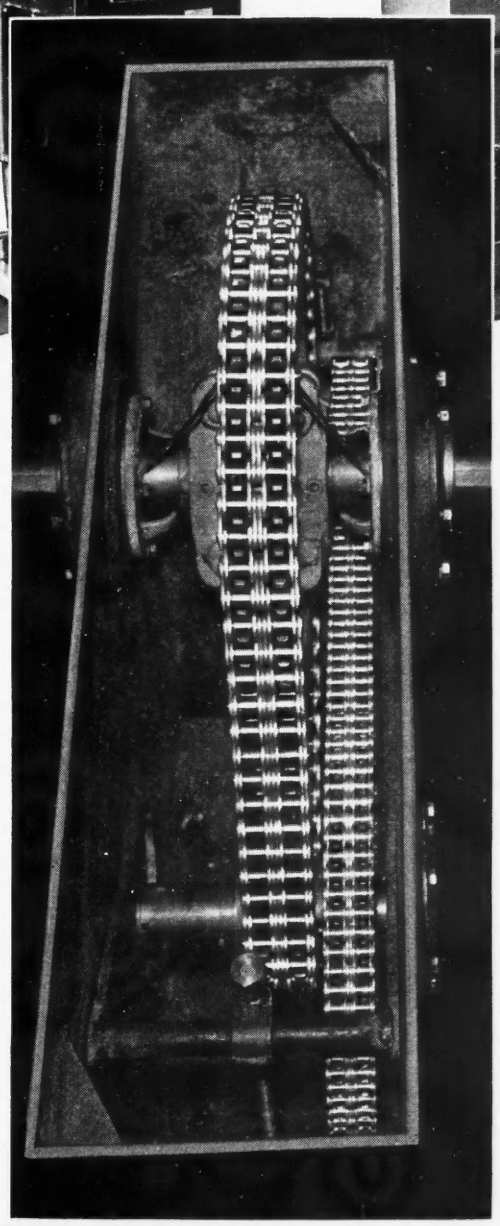
Drives New Bridgeport Pumping Unit





1939
NEW YORK WORLD'S FAIR EXHIBITOR METALS BLDG.

● Bridgeport Machine Company's new No. 6 Pumping Unit, which represents a good example of engineering advancement in design and development, includes a new and positive method of chain adjustment. It is a compact, rugged unit with a maximum stroke of 30 inches, has a polish rod load capacity of 6,000 pounds, and an A.P.I. peak torque rating of 38,400-inch pounds at 20 SPM. The horse-power rating of the unit is 7.75.

In keeping with the rest of their design, the manufacturer has selected Link-Belt Silverlink—the super finished steel roller chain, for these pumping units.

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WORLD DEVELOPMENT and TECHNOLOGY

Activities of Shell

Edited by
WM. V. GROSS, Associate Editor

More active year indicated for Shell interests in most foreign countries . . . Company produced more than 10 percent of world's total . . . Outlook fair

DETAILS gleaned from the annual report of the management to the board of commissaries of the Royal Dutch-Shell Group indicate a more active year for the world's largest oil company in several sections of the globe, barring European war, of course.

This outlook, inferred in several places in the report of J. E. F. DeKok, general managing director of the company, may somewhat reflect the tone of feeling among other large oil corporations of international ramifications, for Shell not only produced slightly more than one barrel out of every 10 lifted to the surface last year but was, and is, competing with other major operators in many parts of the world for that production.

Shell's production throughout the world in 1938, amounting to 29,924,381 metric tons, represented a decrease of 2,062,666 tons from the previous year's recovery, but was still enough to allow payment of 17 percent dividend. It was divided as shown in Table 1.

TABLE 1

Country	Metric Tons Produced In 1938	In 1937
Netherlands Indies.	5,407,164	5,095,986
Sarawak	207,000	217,000
Brunei	707,000	576,000
Egypt	226,000	170,000
Rumania	1,514,872	1,682,447
Mexico	953,921	4,193,916
Venezuela	11,309,633	10,280,903
Trinidad	386,543	246,371
United States	7,680,203	7,992,211
Argentina	544,460	555,686
Iraq	978,146	972,182
The German Reich	9,439	4,345
Total	29,924,381	31,987,047

From this table it will be noted that the greater losses were suffered by producing properties in Mexico, Rumania and United States, in the order named.

As to the loss of over 3,000,000 metric tons production in Mexico, this situation was attributed to the act of expropriation March 18, 1938. The Rumanian drop was anticipated because of lack of laws and rules which make development of new reserves worthwhile. This condition of constant decline in Rumanian production is expected to continue for all private companies until the petroleum laws are changed and until the foreign exchange situation improves. The decline in United States was in keeping with the general decline of production in that country due to proration moves in important oil states.

Plan for Reworking Concessions

Possibility that the Shell Group may re-explore some concessions and wildcat acreage hitherto practically abandoned and become active on others hitherto passed up was seen by some in the remark of the managing directors when they were speaking of the progress in their organization's drilling technique, viz.: "Thus it was possible in the past year to drill formations successfully on which a few years ago all attempts to sink exploration wells had failed . . . Moreover, the rate of drilling is constantly being speeded up and it was found that wells of a depth of no less than 2500 meters (8225 feet) which even 2 years ago involved 75 days' work, can now be drilled in the same field and under the same conditions in less than 40 days."

Shell is strong on constantly improving technical equipment and technique. That it will continue to buy materials commensurate with maintenance of its high standards in these respects may be inferred from reference of the managers in their report to a decision to sanction intention of Bataafsche Petroleum Maatschappij, chief operating subsidiary in Netherlands Indies, to contract a debenture loan of 100,000,000 guilders (about $40,000,000) and a private loan of 75,000,000 guilders (about $30,000,000) to keep its share of the industry abreast of the times.

Tanker Fleet Increased

The organization is one of the greatest ocean carriers of crude and refined products. The group's fleet transported 25,501,000 metric tons of cargo in 1938. It worked to full capacity, but the company added 24 new ocean going tankers during that period. Before 1939 is concluded, plans call for launching an additional 24, all of which were under construction as the report was being submitted. Deadweight tonnage of the 24 tankers added to the fleet in 1938 totaled 256,000 tons; that of the additional 24 to be added before the opening of 1940 will aggregate 280,000 tons. These data indicate a distinct possibility that Shell tankers may move more than 25,000,000 tons in 1939 and that the company is not pulling in its horns on oceanic transportation of petroleum and refined products. They indicate also a faith in the future of international relations in most instances.

Production Increased in Indies

It was noted in the foregoing table that Netherlands Indies production of the Shell Group registered a sharp increase—from 5,095,986 metric tons in 1937 to 5,407,164 tons in 1938. Regarding this section of the world, the report says:

"Exploration work in these areas was vigorously pursued and a new area, the further exploitation of which will benefit our refinery at Pladjoe, was proved to be oil bearing in the 5-a contract field Limau in the Palembang [South Sumatra] district.

"Two agreements were concluded between the government and Bataafsche

Record English producer makes 700 barrels in week

D'Arcy Exploration Company's Eakring 1, Nottinghamshire, England, concluded the first week's production test with an aggregate of 700 barrels to establish the record of the largest producer completed in England. It was completed in sandstone at 1914 feet.

Anglo-American Oil Company's Midlothian 3, at Dalkeith, was reported pumping from 50 to 60 barrels per week.

Regarding the well at Eakring, the original intention of D'Arcy Exploration Company was to drill to the Carboniferous limestone, then expected at around 3000 to 3500 feet, according to word received subsequent to the cabled advise contained in the first paragraph. As a matter of fact, some 50 feet of sand was struck in Lower Carboniferous at 1914 feet.

The preliminary test conducted on the well late in June resulted in the above referred to production of high-grade oil.

A second Eakring well will be drilled immediately with the original objective, the limestone.

Structural conditions at Eakring are stated to be good, the anticline being wide and of considerable length.

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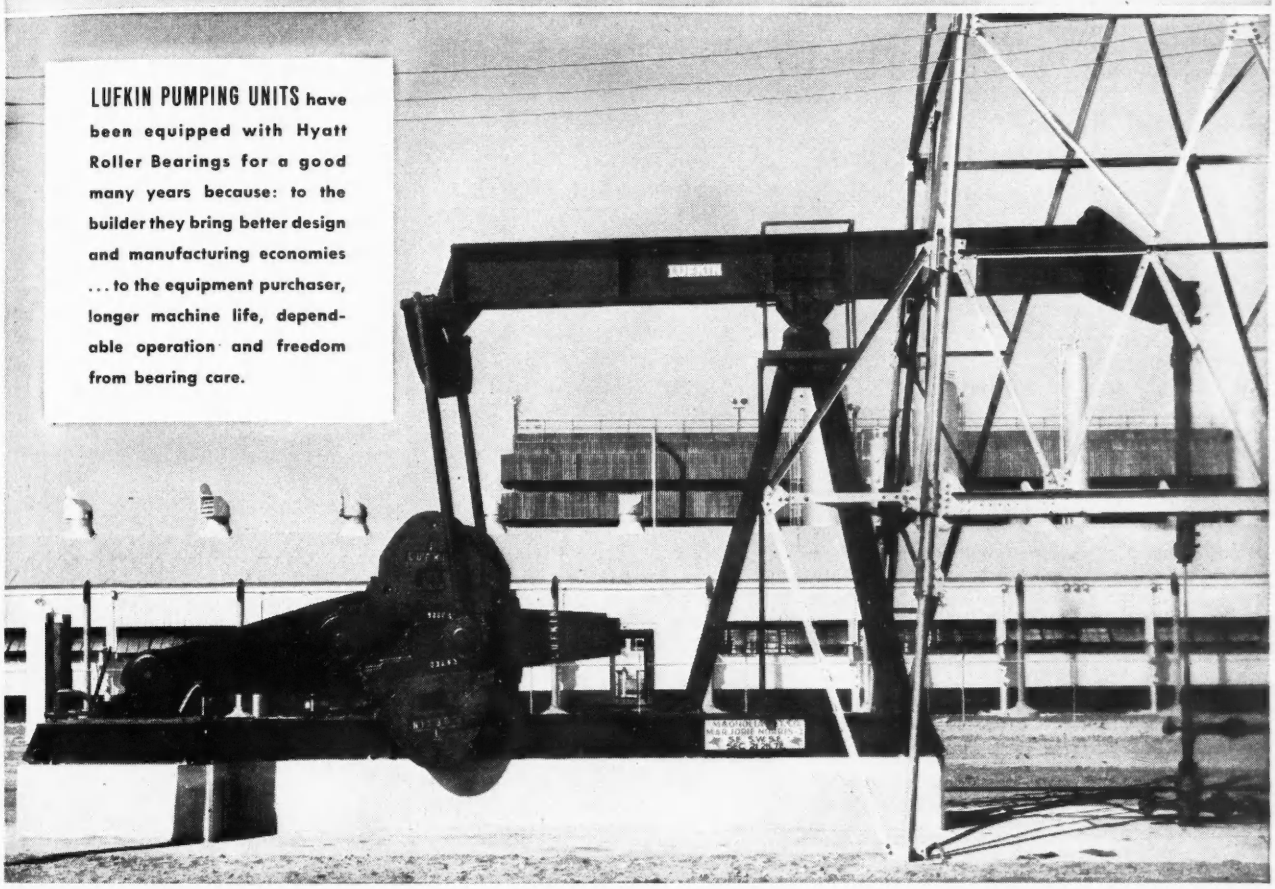

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HYATT *Roller Bearings*

Petroleum Maatschappij on the basis of Section 5a of the Netherlands Indian mining law for the exploitation of two fields in Java, the so-called West Java block in West Java and the so-called Tobo block in Central and East Java."

Production of the Shell Group in Netherlands Indies during 1937 and 1938 in indicated by the accompanying Table 2.

TABLE 2

Territory	Production in Metric Tons 1938	1937
Sumatra	1,564,999	1,326,116
Borneo	984,686	1,005,781
Tarakan	735,098	733,619
Java	926,361	952,118
Ceram	81,714	72,140
N.I.A.M. fields*	1,114,306	1,006,212
Total	5,407,164	5,095,986

* Nederlandsch-Indische Aardolie Maatschappij, jointly owned by Bataafsche Petroleum Maatschappij and the Netherlands India government.

While Table 2 showed a substantial production increase for 1938, it is possible the organization contemplates still further increase in Netherlands India crude output in 1939, for both the chemical and cracking units at Pladjoe put into operation in 1938 were bolstered by completion early in 1939 of a fourth distillation unit. Moreover, the building program was extended in 1939 by a fifth distillation plant, a second installation for reforming heavy benzine, and a factory for production of special benzines, "together with the extensions thereby involved to the plants for supplying current, steam and water to the storage space for crude oil and products." With the cooperation of the government, the company is dredging out the shoal at the mouth of the Moesi River so tankers can take on full load at Pladjoe instead of the partial ones as heretofore.

TABLE 3
Production of Nederlandsch-Indische Aardolie Petroleum Maatschappij in Netherlands Indies

	(Figures in metric tons) 1938	1937
Djambi Fields, South Sumatra		
Badjoebang	239,207	204,637
Tempino	612,702	584,120
Kenali Asam	134,687	90,503
Betoeng	23,457	6,572
Meroe Senami	506	...
Toeba Obi	154	...
Aroebaai Fields (North Sumatra)	103,593	120,035
Boenjoe	...	345
Total	1,114,306	1,006,212

Some idea of the importance of Limau, referred to above as one of the new fields, to the group may be obtained from the decision to build a 90-kilometer 8-inch outlet for the field, the route being from nearby Praboemoelih to Pladjoe.

Fields operated by Nederlandsch-Indische Aardolie Maatschappij, a joint company of Bataafsche Petroleum Maatschappij and the Dutch colonial government, show a distinct upward trend in production. The Djambi fields of South Sumatra, for instance, produced 885,832 metric tons to the joint company's account in 1937; 1,010,713 tons in 1938, according to the report, and according to Basil B. Dahl of Batavia, 291,538 metric tons in the first quarter of 1939. A breakdown of N.I.A.M.'s production by fields for the two years is shown in Table 3.

It will be seen from Table 3 that six of the eight producing districts listed registered increases in production and that two of these six did not appear in the 1937 production column. Djambi district, as the table shows, contains the most important of the fields. What may be expected of the region during 1939 and 1940 is possibly indicated in the action of the company in constructing 133 kilometers of loop line to increase the capacity of the Djambi outlet to 100,000 metric tons of oil per month, or roughly 8,400,000 barrels per year, using seven as a conversion factor, which may be a bit high.

Indications are that exploratory work in Dutch New Guinea will continue although the Shell's affiliate in adjoining Papua threw up the sponge this spring. The managing directors' report in this connection says: "Dutch New Guinea Petroleum Company, in which our group participates to the extent of 40 percent, vigorously pursued its activities. The air mapping work [in New Guinea] was practically completed. The regional surface reconnaissance was likewise finished, and the geological semi-detail and detail survey, begun in 1937, was continued, the seismic method being utilized in the Vogelkop and Bomberai."

Toward the end of May drilling was started at Sele, while a test had been started earlier in the year at Wasian as a result of the above work.

Additional details concerning Shell's activities abroad will appear in a subsequent issue.

Report says Mexico sells Brazil 5,500,000 barrels

Santo Vahlis, representing the Brazilian firm of Correa and Castro, was quoted in Mexico City, July 4, as saying Brazilian interests had contracted for 5,500,000 barrels of Mexican crude and petroleum products annually from Petroleos Mexicanos and as emphasizing that the deal was one for cash.

Saldana Galvan, whom Cardenas sent to South America to seek markets for oil produced from properties seized from American, Dutch and British oil companies March 18, 1938, was reputed to have worked with Vahlis on the deal.

The Brazilian is quoted as saying, "We are going to install a most modern refinery at Rio de Janeiro costing more than $3,000,000." He said the new plant would have a capacity of 10,000 barrels daily and would be supplemented by one under construction at Sao Paulo with a capacity of 7000 barrels daily.

Neither of the refineries is scheduled to go into operation before the end of February, 1940, but, according to Vahlis, purchase of Mexican crude has already been started.

Three rigs to be busy on Pantepec Venezuela leases

Standard Oil Company of Venezuela plans to keep 3 rigs in operation until the contract with Pantepec Oil Company calling for 14 wells on the latter's Venezuelan holdings is fulfilled, according to Eugene Holman, president of Creole Petroleum Corporation, parent company of the Venezuela Standard.

Five out of the first six completions on Pantepec holdings in Eastern Venezuela have been noncommercial. The first, however, Tabasco 1 in the Temblador area, was good for from 300 to 400 barrels of fairly heavy crude.

Since the Temblador efforts Standard of Venezuela has completed a well on El Roble prospect for 800 barrels of 44-gravity crude through 3/8-inch choke, a development which calls for additional drilling in this new eastern Venezuela field.

El Roble is 10 miles from the route of the 100-mile line being laid by Standard and Mene Grande Oil Company from Oficina to tidewater on the Carribbean at Guanta, a project which is slated for completion in September. It will have a capacity of 100,000 barrels daily.

Britishers enroute to consider Canadian line

Alberta oil men last week welcomed news that a delegation of British oil company representatives left London for the United States and Canada to investigate the feasibility of constructing a crude oil pipe line from the Turner Valley field to the head of the Great Lakes.

The delegation represents two British companies and will carry out the investigation on behalf of a larger group of companies, probably four altogether.

A Canadian delegation comprising representatives of the Alberta and Dominion governments and of Alberta oil operators recently returned from an extended sojourn in England, where they consulted with British oil and financial interests and officials of the admiralty, advising them of the Alberta field's importance from a defense standpoint.

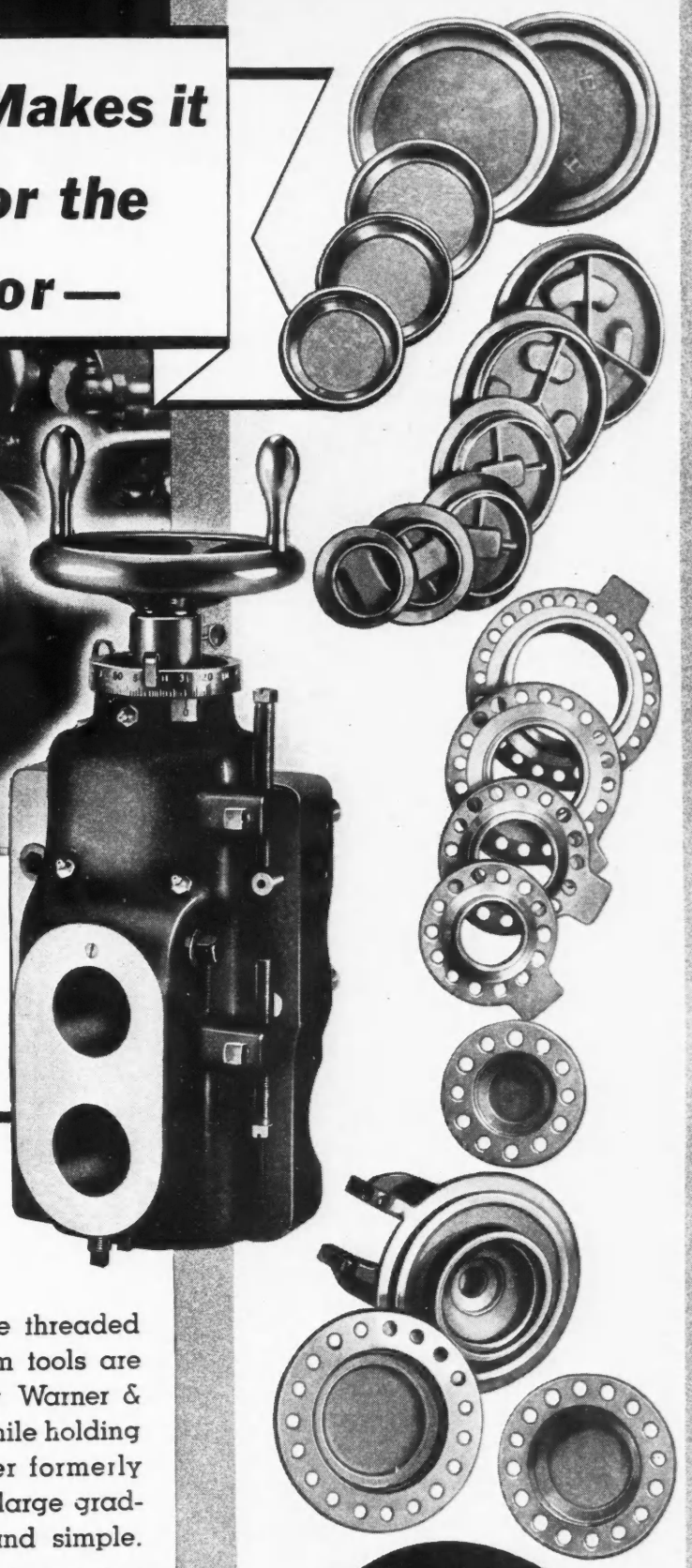
The line would cost an estimated $30,000,000. Terminating at Fort William, it would permit movement of crude east by tanker on the Great Lakes to the rich Ontario and Quebec markets.

Turner Valley field, the only major crude oil field in the Dominion, now has an allowable production of 27,000 barrels daily, sufficient to serve the Alberta and Saskatchewan markets. While the field's potential is in the neighborhood of 60,000 barrels daily, it is not likely that conservation authorities would permit production much in excess of the present allowable as petroleum engineers are agreed that such action would shortly ruin the field.

Peruvian production wanes in April, refining slack

Peruvian crude oil outturn of 1,151,193 barrels during April, 1939, was 14.9 percent under the figure for April, 1938. For the same period refinery runs by International Petroleum Company, principal operator, declined 1.5 percent to 518,929 barrels, and natural gasoline production during April, 1939, by International and Cia. Petrolera "Lobitos" slumped 0.5 percent to 98,114 barrels.

This SLIDE TOOL Makes it EASIER for the Operator—



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This operator is working on a No. 1-A Warner & Swasey Turret Lathe in the Buckeye Iron and Brass Works, Dayton, Ohio, turning a variety of fill caps. There is a forming cutter to neck the threaded diameter, as well as face the seat. Different form tools are used for different sizes. The rigidity of the new Warner & Swasey Slide Tool makes faster feeds possible while holding sizes for the forming cuts. Troublesome chatter formerly encountered with old slide tools is eliminated. A large graduated dial makes adjustment of cutters easy and simple.

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MEN IN THE INDUSTRY'S NEWS

FELIX R. CORBELL, superintendent of production for Magnolia Petroleum Company in the Talco field, Northeast Texas, has been transferred to Lovington, New Mexico, as superintendent of the Lea district. He succeeds R. H. Alexander, who died June 24. Talco operations will be placed under the supervision of Harvey Lee, superintendent of the north portion of the East Texas field, with headquarters at Greggton.

SAM GLADNEY, East Texas district land man for Sun Oil Company with headquarters at Tyler, has been moved temporarily to the Southwest Division office at Dallas.

C. B. JETTER of Greenville, Michigan, contractor and producer, and V. M. Voorhees, contractor and producer, are recovering from critical injuries sustained in automobile accidents. Jetter is in a Detroit hospital; Voorhees in a Clare hospital. They were injured in separate accidents.

J. D. McCLURE is in charge of Barnsdall Oil Company's recently opened offices in Holland, Michigan.

L. G. E. BIGNELL has been appointed secretary of the petroleum division of the American Society of Mechanical Engineers. Bignell has been serving as secretary of the Tulsa Engineers Club. He is one of the organizers of the division over which he now becomes secretary.

GEORGE W. CUNNINGHAM, who has been in charge of the legal department of Shell Oil Company, in Tulsa, has been transferred to headquarters at St. Louis, where he will be assistant to Joe T. Dickerson. His place in Tulsa will be taken over by Paxton Howard, who has been assistant to Cunningham.

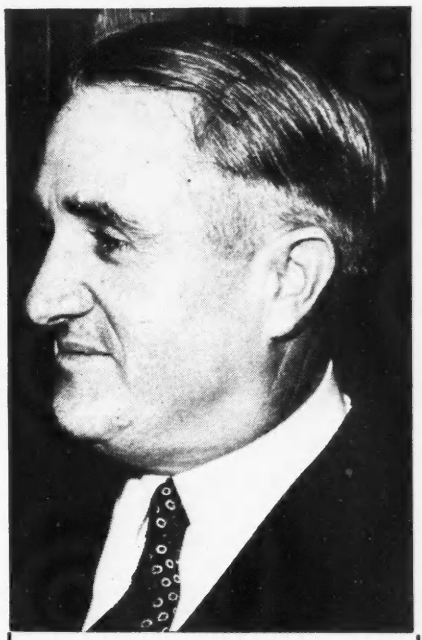
LELAND DAVISON, district landman for Tide Water Associated Oil Company at Wichita, Kansas, has been transferred to Tulsa headquarters.

J. L. TRACY, former secretary-treasurer of Caddo Oil Corporation, was elected president at the annual meeting held at Fort Worth last mid-week. He succeeds W. M. Holland of San Angelo, Texas. Henry Benson, Montreal, Canada, was re-elected vice president, and Ralph Salter, Toronto, Canada, was chosen secretary-treasurer. The company recently moved its headquarters from San Angelo to Fort Worth on the strength of production strikes in Young County.

CLINT W. MURCHISON, vice president of American-Liberty Oil Company, Dallas, staged a picnic July 6 for the employees of the above company and those of Aloco Oil Company and American-Liberty Pipe Line Company at his recently completed country estate on the outskirts of Dallas.

GROVER CONRAD, president of Oil Well Drilling Company, Dallas, is vacationing with his family in California.

G. W. WHEELER, Gordon W. Johnson and W. H. Brooks have organized the Gienna Oil Company as a Texas corporation with headquarters in San Antonio.



J. SAYLES LEACH, who recently succeeded T. J. Donoghue, retired, as executive vice president of The Texas Company, and as chairman of the Houston Committee of that organization, an appointment which makes him the ranking executive in Houston, started with The Texas Company as a bookkeeper in the Dallas sales district in 1917, after majoring in mathematics and foreign languages to obtain a degree from Baylor University at Waco, Texas, in 1915. His position as bookkeeper in Dallas did not last long as he was shortly transferred to Wichita Falls as a salesman. This was during the Burkburnett boom. In 1921 Leach was recalled to Dallas as assistant district manager. February 15, 1927, he was made assistant manager of the sales department of the southern territory. April 1, 1929, he became manager of the southern territory, and later vice president in charge of sales in the area.

Leach played football and baseball in college; today he golfs and fishes. He is a director in the Houston Chamber of Commerce, Houston Community Chest, Houston Country Club and the Texas State Safety Council. He is married and has two daughters.

RILEY MAXWELL, geologist for Oil States Exploration Company, heads up the newly organized Abilene Geological Society which held its first open meeting at the Wooten Hotel in Abilene last week. Other officers of the organization, which has become affiliated with the West Texas Geological Society, are Carl Shoults, consulting geologist, vice president, and Gene Boehm, chief geologist for Forest Development Corporation, secretary.

JOSEPH H. RUSSELL, assistant to the vice president of Gulf Oil Corporation at Houston, has been named to head the city's Community Chest drive in November.

WALLACE E. PRATT, New York, director of Standard Oil Company of New Jersey, is in Houston.

W. L. HINDS, partner in a Houston drilling firm, was injured critically on July 4 when his car collided with another on the Houston-Galveston highway. Hinds incurred a skull fracture.

H. D. CLAY, Clarion, is general chairman in charge of the United Natural Gas Company's annual outing to be held in Ludlow, Pennsylvania, July 29. He is being assisted by G. D. Barber, Oil City, and the following commitee chairmen: Program—G. C. Klingensmith, Franklin; grounds and equipment—C. R. Cartwright, Kane; attendance—Mable Andre; sports—G. M. Stewart; prizes—Garnet Morris; dance—E. R. Davis; entertainment—H. C. Rose; publicity—L. J. Gibson, and, first aid—Janet Henderson.

DR. A. D. LLOYD, geologist and independent operator of Fort Worth, Texas, was vacationing near Wisconsin Rapids, Wisconsin, last week.

ROBERT W. McDOWELL, vice president of Mid-Continent Petroleum Corporation, returned to his Tulsa office last week following a trip to England, France and Switzerland.

CORNELIUS KROLL, Houston, president of the Southport Oil Company of Texas, heads up the new Southport Oil Company being organized as a Delaware corporation.

HENRY B. MAY, Dallas operator, has organized the Mayson Oil Company to drill a wildcat test in the northwest Missouri section of the Forest City basin.

HENDERSON COQUAT, Lee Peters and Ralph Robinson have organized the Three Rivers Refinery as a Texas corporation to engage in the operation of a pipe line. Headquarters have been established at Three Rivers.

KERMIT WOODMAN, scout in the Kansas district for Phillips Petroleum Company, was looking over Nebraska last week.

CLAREL B. MAPES, executive secretary of the Mid-Continent Oil & Gas Association, Tulsa, was visiting in Dallas last week.

DR. B. B. BOATRIGHT, of Parker, Foran, Knode and Boatright engineering firm, Houston, discussed "Valuation of Oil Property" before a group of Alberta oil operators and civic organization members in Calgary last week.

ARTHUR P. EBERLIN, secretary-manager of the Evansville (Indiana) Chamber of Commerce, is busy arranging an "appreciation picnic" to be given August 9 by Evansville business men to members of the oil fraternity in the tri-state area of

Indiana, Illinois and Kentucky. Aiding him are William Jensen, James Jordan, Ed DeGroote and N. Hahn.

ALFRED HURLBURT, vice president of Republic Natural Gas Company, Dallas, was in Wichita, Kansas, last week.

PAT BROACH, of the crude oil purchasing division of the Standard Oil Company of Indiana in the Kansas district, is on vacation in the Lake of the Ozarks country.

W. J. JONES, production manager of M. L. Benedum Corporation, Pittsburgh, stopped off at Winnipeg, Manitoba, last week en route to the Peace River district of Northern Alberta where he will supervise wildcat drilling operations.

R. HAL COMPTON is president of R. Hal Compton Crude Oil Purchasing Company which last week was authorized to do business in Illinois. The firm, of which Edward L. Brown is secretary, has its headquarters in Owensboro, Kentucky.

FRANK T. EGAN has resigned as secretary-treasurer of the Petroleum Association of Illinois, to resume his duties as managing director of the Centralia (Illinois) chamber of commerce after an absence of two months.

I. A. WHITUS, Dr. H. H. Niehaus and Clyde Cox last week organized the Independent Petroleum Corporation as a Texas firm with headquarters at Gladewater.

H. N. PARDEE, Illinois division manager for The Texas Company, and other company officials were guests of the Salem Lions club recently. A bronze plaque was presented for the office of the company, along with a bronze tablet to mark the company's Tate 1, which opened the Lake Centralia-Salem pool a year ago. Besides Pardee, those who spoke at the gathering included W. C. Neal, superintendent of the company; Don Rounds, land superintendent, and W. N. Thompson, S. Simpson and H. L. Alexander, all of the Central States Pipe Line Company, Texas subsidiary.

JOHN "PINEAPPLE" HARRINGTON, independent operator now active in Alabama, was visiting in Dallas last week.

LARRY SEE, Wichita operator, was looking over North and South Dakota last week.

R. HESS QUISENBERRY, O. H. Bell and W. H. Wellmerling last week chartered the Quisenberry Drilling & Production Company as an Illinois corporation with headquarters in the Monroe Building in Bloomington.

W. H. WRIGHT, L. A. Engel and T. H. Cobbs last week organized the Wallace Wright Oil Corporation as an Illinois firm with headquarters at 10th and State Streets, East St. Louis.

G. L. WILBANKS, Jess Wilbanks and Joe Beard have organized Joe Beard, Inc., as a Texas drilling contracting firm. Headquarters have been established at Big Spring.

F. S. COURTER, Dowell, Inc., acid engineer, has been transferred from Hobbs, New Mexico, to Allegan, Michigan.

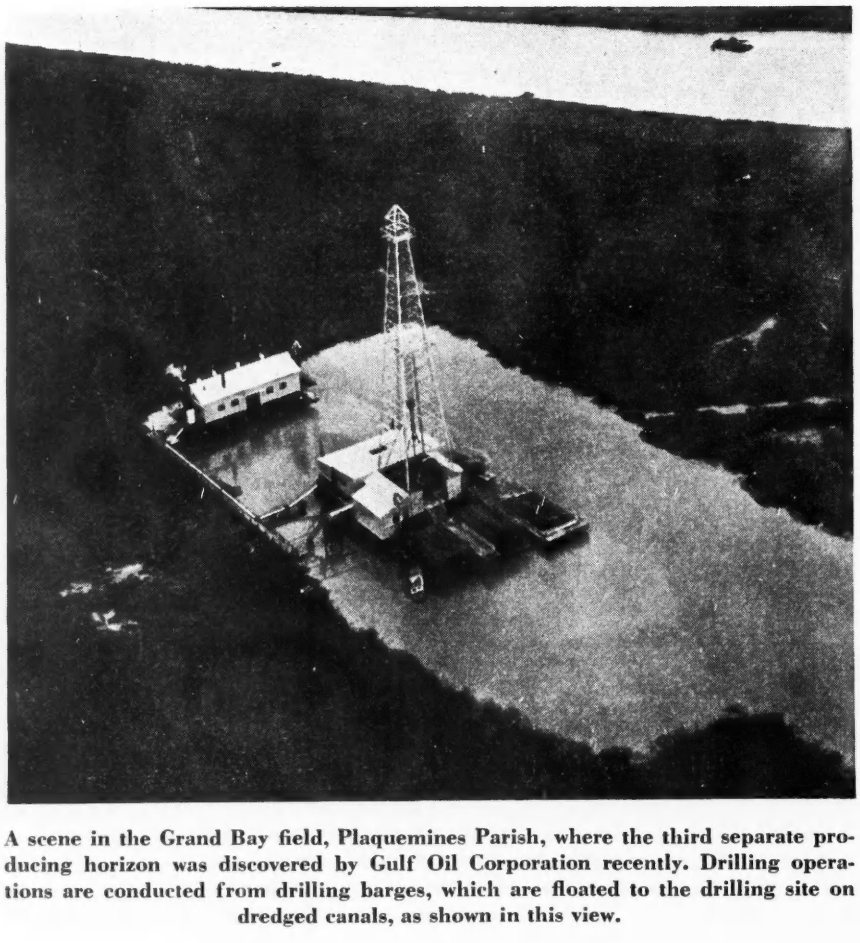
M. E. BROCK, Gulf Oil Corporation, Houston, has been in Toronto, Canada.

DICK SCHWAB, Houston independent operator, is in Colorado. His associates are prepared to lisen to some tall fish tales upon his return.

DIED:

HERBERT BAKER, 73, chairman of the board of the old Vacuum Oil Company and later vice chairman of Socony-Vacuum Oil Company, died July 4 in a hospital at Sayre, Pennsylvania, after an illness of several weeks. He was with Standard Oil Company from 1881 to 1906, when he joined the Vacuum organization, of which he was treasurer from 1912 to 1928 and a director from 1918 to retirement in 1932.

CLIFF HICKMAN, 43, independent operator active for the past eight years in East Texas, died in a Dallas hospital June 28 of a heart ailment. Survivors include his wife, five brothers and four sisters.



A scene in the Grand Bay field, Plaquemines Parish, where the third separate producing horizon was discovered by Gulf Oil Corporation recently. Drilling operations are conducted from drilling barges, which are floated to the drilling site on dredged canals, as shown in this view.

Adams Oil opens Indiana office

Adams Oil and Gas Company has opened an office in the Hulman Building at Evansville, Indiana, with Harry H. Lawson in charge. Russell Sparenberg, formerly with Skelly Oil Company, is district geologist, and Walter Watson is scout.

Adams Oil and Gas Company will maintain its office at Centralia, Illinois, where C. J. Haas is production superintendent and Walter Johnson is geologist.

Harry Lawson will be in charge of all land department work in both Illinois and Indiana.

League City operators to hire development engineer

Principal operators of the League City pool of Galveston County, Texas, which include Phillips Petroleum Company, Mid-State Oil Company, George F. Echols Company and Salt Dome Oil Company, are forming an operators' committee which will employ a competent engineer to have charge of the pool. This step has been taken to insure modern and scientific methods of development, operation and conservation in this deep Frio sand production

The League City operators' committee is a unique organization in that two of the largest royalty owners in this pool are joining in the agreement and will have representatives on the committee. This recognition of the rights of royalty owners is an unusual feature that will be watched closely by other operators.

The pool is receiving an outlet for its crude by a line which will extend from the field to a junction that will connect it with the main systems of the Gulf Coast area.

THE WEEK'S NEWS SUMMARIZED

Allowables

Three petitions for higher per well allowables in the East Texas field, filed as a result of the Rowan & Nichols court decision, have been denied by the Texas Railroad Commission. Three additional petitions have been filed. The decision declared the method of prorating in East Texas invalid because acreage was not considered, and granted an injunction permitting Rowan and Nichols to produce a larger quantity than allotted by the commission.

Meanwhile, the three members of the commission also made it known that reports the East Texas order would be revised to conform to the court decision were erroneous, pending a final decision from the United States Supreme Court. They point out that any such modification or revision would render moot the suit now on appeal.

California's Governor Olson as yet has not fixed his signature to the legislative-approved oil control bill, although he is still expected to do so. The delay in signing the bill is causing numerous rumors to be circulated.

Trust Damages

A jobbing firm in southern Wisconsin has filed suit for damages because of alleged illegal anti-trust statutes practices. This is but another of an anticipated series of similar suits growing out of the indictments at Madison, Wisconson. The concern seeks $1,684,583 in damages against nine companies, on the grounds that its profits were lessened by the alleged price fixing activities of the companies.

At Washington

Consolidation of all petroleum activities of the federal government, probably under the Secretary of the Interior, is expected to be a major feature of President Roosevelt's next plan for reorganization of administration duties. This would include work of the Petroleum Conservation Division, the oil activities of the Bureau of Mines, the Geological Survey, Department of Commerce and the General Land office.

Recent extension of the Connally hot oil act will cover 90 percent of the nation's petroleum production when the California conservation statute becomes effective, in the opinion of Harold L. Ickes, secretary of the interior. This would lead only one large producing state, Illinois, outside the realm. Ickes asserted passage of the measure made possible the continued joint action of the federal government and the principal oil producing state in the conservation of oil and gas resources.

Spacing Rules

Field development rules and allowable orders issued by the Texas Railroad Commission last week were of interest because they showed the tendency toward wider well spacing and the inclusion of acreage as a proration factor. Rules provided for 20-acre spacing in four fields, 17.8 acres in another, while operators asked for 40-acre spacing in still another pool. Two of the fields are to be prorated on a straight acreage basis, one 75 percent on acreage and 25 percent on well potentials, and another one 50 percent on acreage and 50 percent on the number of wells.

Statistics

Increased crude production, larger runs to stills, higher gasoline production, a reduction in stocks and additions to both light and heavy fuels were reflected by the latest weekly statistics.

Crude runs to stills jumped 50,000 barrels to 3,480,000 barrels daily, which placed them 12.4 percent higher than a year ago and very close to an all-time peak. This caused gasoline production to rise to 1,703,000 barrels, or 39,000 barrels more than in the preceding week. Nevertheless, the markets absorbed the high output and an additional 631,000 barrels from storage.

Crude production was up but 10,200 barrels and the large volumes sent to stills caused 2½ million barrels to be drawn from tanks.

Prices

Although there was further evidence of an unsettled gasoline market, prices were mostly unchanged last week. Tank car prices dropped 2/10 of a cent a gallon in New York and New England states.

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Allowable Picture

No changes in East Texas proration method pending final court decision; deny petitions for allowable increases; survey of producing ability to be made

Petition for higher East Texas allowables denied

Several press accounts have been circulated concerning prospective action by the Texas Railroad Commission resulting from the Federal District Court decision in the Rowan & Nichols suit. Some of these accounts have been misleading in that they express the opinion the commission order on East Texas will be revised to conform to this decision, or that exceptions will be made in the cases where petitions have been filed.

This view is entirely erroneous. Each of the commissioners has stated positively that the commission intends to grant no exceptions nor does it intend to alter its order in any respect, pending a final decision from the United States Supreme Court. They point out that any such modification or revision would render moot the suit on appeal.

Further than that, the commission has, in effect, denied the first three petitions filed. Magnolia Petroleum Company, Humble Oil & Refining Company, and Sun Oil Company filed their petitions prior to the issuance of the July statewide proration order and asked that their leases be excepted in that order and the formula used in the Rowan & Nichols suit applied. Subsequently the commission issued the order without making these exceptions, and therefore, refused to grant these applications.

Petitions were filed later by Tide Water Associated Oil Company, Selby Oil and Gas Company, and Westheimer & Neustadt. These six are the only petitions which have been received.

The net result of the commission's decision is to require operators to file suit in Federal Court and obtain relief on the same basis that this relief was granted to Rowan & Nichols. It is possible that some of the petitioners will file suit during the summer, but the belief is general in Austin that no suit will be filed prior to the next statewide proration hearing in September.

At this time, some revised plan of proration will probably be offered for the commission's consideration. If no action is taken by the commission (and no action will be taken by the commission), then the petitioners will have no other course than to go to the court house.

Take Oklahoma Class C potentials during July

Potentials of wells in Class C fields in Oklahoma will be determined during July for the period between August 1, 1930, and February 1, 1940.

In the South Britton, Fitts (Hunton lime, upper Simpson and Wilcox sands) East Sasakwa (Wilcox sand) potentials will be fixed by declining the last official potential at 3 percent per month from the date they were effective. For the Langston and North Lucien pools producers will have the privilege of taking the 3 percent per month decline or of taking physical tests. Physical tests will be for 6 hours through 2½-inch tubing, with the output of the last 4 hours of the test to be multiplied by 6 to determine potential.

Begin court action on Kansas proration regulation

An attack on the Kansas conservation statute, as amended by the last legislature, has been started in Ellsworth County, where a district court has been asked to grant a restraining order to prevent the Kansas Corporation Commission from enforcing the proration order of May, 1939. This order called for a reduction of 2½ barrels per month in the Lorraine pool, where allowable was then 25 barrels per well, until well output reached 15 barrels per well in August.

Winkler-Koch Engineering Company and Courtney B. Davis, Inc., both of Wichita, filed the petition on the plea that the order, if followed, will result in abandonment of some wells and also result in waste.

East Texas allowable status report ordered

The Texas Railroad Commission has ordered a report showing the status of all East Texas wells with relation to their ability to make allowables. These reports must be filed at Kilgore by July 15.

Kansas allowable unchanged; is above federal figure

Allowable for Kansas oil fields in July was fixed at 165,880 barrels, identical with the June figure, by the Kansas Corporation Commission July 3. Estimates of the United States Bureau of Mines were 160,300 barrels daily for Kansas fields in July.

The order also calls for another 25 percent reduction in the special allowables, existent in several fields. The policy of the commission is to eliminate special allowables by August and 75 percent of these allowables were removed by the July order.

Oil at the Capitols

California's control act still unsigned . . . Plan to put oil under one federal agency . . . Illinois only large state outside influence of Connally Act

Atkinson oil control bill lacks governor's signature

Governor Olson has yet to sign the Atkinson oil control bill that was passed by the California legislature in the late hours before official adjournment. The governor had 30 days in which to affix his signature to this important measure.

In the meanwhile rumors are going around to the effect that the governor is delaying the signing for no other reason than to give the opposition a good case of jitters. For, if the bill is signed late this month, it leaves but 60 days in which petitions may be circulated to obtain nearly 150,000 names to place the control bill on the ballot to be voted upon by the people. Reports are heard to the effect that only one major oil company now is openly supporting the measure, while the remainder are said to have let it be known, unofficially, that they don't like the bill, don't want it, and will fight it from the moment the governor signs on the dotted line.

Connally act covers 90 percent of production

Recent extension of the Connally "hot" oil act will cover 90 percent of the petroleum production of the country when the California conservation statute becomes effective, and the only large producing state without such legislation will be Illinois, it was pointed out last week by Secretary of the Interior Harold L. Ickes.

Commending the continuance of the law, Secretary Ickes asserted it "makes possible continued joint action of the federal government and the principal oil-producing states in the conservation of the oil and gas resources of the United States."

"This joint action of the state and

federal governments is preventing waste and increasing the efficiency of oil production in the United States," he said. "Our petroleum supply is being maintained to an important degree by improvements in methods of production, which make possible an increased recovery of oil from our proved reserves. By making certain that we produce oil in the United States more efficiently and with a higher recovery factor than in other countries, our oil supply can be brought closer to a parity with the oil resources of the rest of the world and we can thus postpone the time when we will have to depend upon foreign supplies or alternative fuels, both at higher prices.

"By giving strong support to the state oil and gas conservation laws, the Connally law has made a substantial contribution to the conservation of the oil and gas resources of the nation, and the federal and state responsibilities in this respect have been coordinated without placing any undue burden upon the consumer of petroleum products. In fact, I am convinced that the consumer will continue to benefit if the policy announced in the Connally act of making adequate supplies of oil available at reasonable prices is adopted as permanent legislation of the United States."

Consolidated oil agency planned by President

Consolidation of all petroleum activities of the federal government may be a major feature of President Franklin D. Roosevelt's next plan for reorganization, it was learned in Washington last week.

Proposals which have been worked out contemplate the merger of the Petroleum Conservation Division and the oil activities of the Bureau of Mines, the U. S. Geological Survey, Department of Commerce, and the General Land Office.

The consolidated oil agency probably would be placed under the Secretary of the Interior, a position now held by Harold L. Ickes.

Federal depletion changes likely

Changes in methods of computing the depletion deduction for oil producers will be recommended to the House Ways and Means Committee by the Treasury when it begins the drafting of new revenue legislation next session.

The question was touched upon during recent hearings by the committee on proposals to make future issues of government bonds taxable as to interest, Undersecretary of the Treasury John W. Hanes disclosing that the department has been engaged on a study of depletion for the past eight or nine months.

The investigation has not yet been completed, Hanes said, but will be finished before the committee undertakes the proposed general over-hauling of the tax system, at which time the department will be prepared to make its suggestions.

Majority of joint land owners given power to act

Governor Henry Horner of Illinois last week signed a bill sponsored by Senator Louis Menges providing that a majority of joint owners of land can procure a court order to drill for oil and gas if the property borders land on which other wells have been drilled and which threaten to drain the property of its minerals.

Awaiting the governor's approval or veto was a house bill to revise restrictions on plugging abandoned oil wells. It requires every person, firm or corporation to file a log of the well in the office of the State Geological Survey within 30 days after its completion, or at time notice is filed of intention to abandon the well, if the well is to be abandoned within less than 30 days after its completion. It further provides that cores obtained by core drilling shall be available to authorized representatives of the survey for inspection and sampling, and that all logs shall be available for public inspection except as to such information which the owner or operator of the well requests to be kept confidential, providing that no such information shall be kept confidential for more than one year.

Oil in the Courts

Distributor asks damages from nine major firms for alleged price fixing . . . California grand jury investigation of trust violations recessed

Another jobber seeks trust violation damages

Another in an anticipated series of damage suits by oil jobbers charging violation of the federal anti-trust laws by major oil companies in alleged illegal practices complained of in the Madison indictments of three years ago was filed last week in federal district court at St. Paul, Minnesota.

The Badger Oil Company, distributing in southern Wisconsin with its principal place of business in McFarland, seeks $1,684,583 in damages against 9 major oil companies, charging illegal fixing of jobber margins. Defendants in the suit are Phillips Petroleum Company, Standard Oil Company of Indiana, Shell Oil Company, Inc., Pure Oil Company, Sinclair Refining Company, Socony-Vacuum Oil Company, Inc., Skelly Oil Company, Cities Service Oil Company and Barnsdall Refining Company.

Alleges Actual Loss

The jobbing company's complaint alleges a conspiracy among the defendant companies to fix and regulate jobber margins in restraint of trade and commerce, which alleged illegal action lessened the plaintiff's margin of profit on gasoline by 2.9 cents a gallon on 10,742,340 gallons marketed between 1931 and 1938, making damages of $311,527. An additional $250,000 is sought for damage to the plaintiff's good will because of the alleged conspiracy, and the total is tripled under provision of the Sherman anti-trust act. Also sought from the defendant major companies are court costs and reasonable attorneys' fees.

The indictment comprising the "second Madison case" charges conspiracy among major companies to fix jobber margins through use of uniform jobber contracts. Although this case has not yet been called for trial, a number of the defendant companies and individuals named in the indictment have entered pleas of nolo contendere and have been fined by the district court at Madison.

Pacific grand jury recesses till July 25

The investigation into asserted price fixing among Pacific Coast oil companies by a special federal grand jury recessed last Thursday and will be resumed July 25 when more important phases will be aired.

Joseph E. Brill, special assistant to the attorney general, left for Washington to confer with his associates on the local investigation into alleged monopolistic practices by members of the oil fraternity. Since the investigation got under way before U. S. District Judge Paul J. McCormick, 40 executives and employes of major and independent oil companies have testified, while a mass of records of oil companies and associations has been subpoenaed and correlated in an effort to obtain evidence to support the government's position. Two years of preliminary work by Department of Justice attorneys and accountants preceded the present investigation following numerous complaints that the Pacific Coast oil companies had violated the Sherman anti-trust law.

Assisting Brill are Henry McClernan and M. S. Huberman of the attorney general's office.

Humble's title to Conroe lease upheld

Title to 618 acres of land in the Conroe oil field, Montgomery County, was validated last week by a decision of the Texas Supreme Court. The court refused a writ of error in State vs. Humble Oil & Refining Company.

The suit brought by the state alleged that the land, which is divided into 2 tracts, was vacant, unsurveyed land belonging to the school fund. The state lost in every court.

Market Situation

Outlook fair for markets as a whole . . . Fear heavy crude runs and gasoline production may prove to be burdensome later . . . Strict allowables helpful

Markets generally steady after good holiday trade

Following the large volumes of business done by service station operators during the July 4 holiday period, the gasoline market was generally steady, and the outlook appeared fair for the markets of the industry as a whole.

However, refinery runs of crude oil have continued exceptionally large, and gasoline production set a new record in the week ended July 1; and there is some fear that operations may be continued around the record levels and that gasoline inventories may prove seriously burdensome in coming months.

That the gasoline market is not particularly stable even now was indicated by a reduction of 2/10 cent a gallon in the tank car prices in New York State and New England July 6.

Such a reduction was posted by Socony-Vacuum Oil Company, Inc., which explained that the revision was made because of a lowering of postings on the Gulf Coast to the North Atlantic seaboard.

Since a week ago there have not been any further important revisions of gasoline tank wagon and retail prices, the nation-wide advance of ½ cent a gallon having proved effective so far on over one half of the business volume involved.

Those advances in the tank wagon prices apparently have assured for some time a maintenance of refinery prices of gasoline around the present improved levels, although further gains in the prices to dealers and consumers may be necessary eventually for maintaining the current tank car prices.

The crude oil markets, similarly, appear fairly stable, in consequence of the improvement of the gasoline market in the past several months.

Helpful to the crude markets are the re'atively strict production allowables of July, just as moderate allowables of June were advantageous.

Increased runs to stills reflected in statistics

The latest weekly statistics of the industry, covering the week ended July 1, reflected a slight increase in crude oil production, larger crude runs to stills, increased gasoline production, a reduction of gasoline inventories, and additions to the stocks of both light and heavy fuel oils.

United States crude oil production rose 10,200 barrels to a daily average of 3,463,000 barrels, but was about 30,000 barrels under the indicated average daily market demand for June, as estimated by the Bureau of Mines.

Crude runs to stills were increased 50,000 barrels to 3,480,000 barrels daily, and were near to the all-time high of 3,510,000 barrels reached a few weeks ago. The runs were 12.4 percent higher than in the corresponding week last year.

Gasoline production rose to 11,921,000 barrels for the week ended July 1, a new record for a week's output, having averaged 1,703,000 barrels daily, or 39,000 barrels a day more than in the previous week.

Nevertheless, the markets absorbed the current production of gasoline plus 631,000 barrels from storage, which was reduced to 81,102,00 barrels. The withdrawal was not large enough, however, to hold the 1939 stocks curve under that of 1938, when inventories were being reduced more sharply. The 81,102,000-barrel inventory on July 1 compared with 80,408,000 barrels held one year previously.

Stocks of gas oil and distillate fuels, being built up in preparation for fall and winter consumption, were increased approximately a million barrels, to 31,230,000 barrels. The supply of these lighter oils, used principally for heating, is about the same as that held at this time last year.

The inventory of residual fuel oil, used in industrial activities, were increased over 1½ million barrels, to 113,388,000 barrels. The stocks of these heavy oils are about 5 percent smaller than at this time last year.

The latest figures on crude oil stocks, for the week ended June 24, showed a further large withdrawal of 2½ million barrels, the inventory having been reduced to 272,297,000 barrels. That was within 3,000,000 barrels of the 17-year low level of 269,509,000 barrels touched on December 10 last year.

Thompson urges stock reduction

Reductions of crude and refined stocks in anticipation of the reduced demand at the end of the present consuming season were recommended last week by Ernest Thompson, chairman of the Texas Railroad Commission.

"It appears to me that the oil industry should prepare now for the winter.

"Crude oil stocks above the ground on September 30 should not exceed 250,000,000 barrels. The rate of withdrawal of 2,500,000 barrels set last week, if maintained, should achieve this result.

"Gasoline stocks stood at 81,733,000 barrels on June 24. This shows a withdrawal of 5,500,000 barrels since the high point of 87,000,000 barrels of gasoline on hand April 22, 1939.

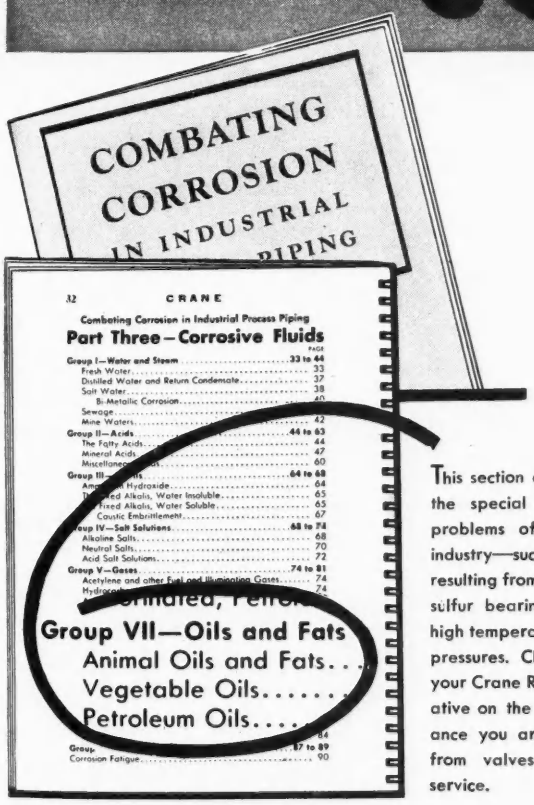
"If gasoline stocks could reach the level

Trends of United States Production and Stocks

Figures are from American Petroleum Institute weekly reports, except those on crude stocks, which are from Bureau of Mines weekly reports

	Crude Oil Production (Barrels Daily)	Crude Runs to Stills (Barrels Daily)	Crude Oil Stocks (Barrels)	Gasoline Stocks (Barrels)	FUEL OIL STOCKS	
					Gas Oil & Dist. Fuels	Residual Fuel Oil
1937						
August 28	**3,731,450	3,425,000	309,506,000	66,997,000	112,111,000	
September 25	3,666,300	‡3,455,000	307,974,000	65,620,000	116,472,000	
1938						
March 19	3,433,550	3,080,000	306,380,000	**93,192,000	122,067,000	
June 25	3,083,900	3,025,000	293,463,000	82,412,000	25,343,000	112,458,000
July 30	3,316,400	3,240,000	288,514,000	76,864,000	27,573,000	116,721,000
August 27	3,388,500	3,255,000	285,029,000	71,754,000	29,747,000	117,179,000
September 24	3,251,150	3,220,000	280,278,000	68,605,000	31,183,000	119,285,000
October 29	3,237,500	3,145,000	275,824,000	67,590,000	33,690,000	120,029,000
November 12	3,243,250	3,180,000	273,394,000	¶67,551,000	34,175,000	120,491,000
November 26	3,260,900	3,295,000	270,563,000	68,628,000	33,749,000	119,885,000
December 10	3,245,100	3,150,000	§269,509,000	68,587,000	32,068,000	118,711,000
December 31	3,201,450	3,115,000	273,024,000	71,695,000	29,082,000	115,741,000
1939						
January 28	3,248,250	3,235,000	271,763,000	77,279,000	26,583,000	112,766,000
February 25	3,328,850	3,185,000	271,758,000	84,597,000	23,419,000	110,252,000
March 25	3,382,350	3,225,000	273,915,000	87,561,000	21,487,000	107,551,000
April 22	3,526,700	3,280,000	277,156,000	*87,769,000	21,058,000	105,035,000
April 29	3,568,200	3,405,000	278,440,000	86,794,000	†25,844,000	†108,409,000
May 6	3,580,900	3,275,000	*278,607,000	86,216,000	26,167,000	108,597,000
May 20	3,438,400	3,460,000	277,068,000	84,294,000	26,389,000	109,405,000
May 27	*3,585,250	3,405,000	278,289,000	84,152,000	26,992,000	109,386,000
June 3	3,558,800	3,415,000	277,947,000	83,637,000	27,440,000	110,219,000
June 10	3,376,950	**3,510,000	274,692,000	82,716,000	29,357,000	111,239,000
June 24	3,452,800	3,430,000	272,297,000	81,733,000	30,239,000	111,726,000
July 1, 1939	3,463,000	3,480,000	.....	81,102,000	31,230,000	113,388,000
July 2, 1938	3,058,550	3,095,000	‡293,463,000	80,634,000	⊙	+
Change from year ago	+13.1%	+12.4%	−7.2%	+0.06%	+0.5%	−4.7%

** All time peak. * Peak for 1939. § Lowest for 17 years. ‡ Stocks, June 25, 1938.
‡ Peak prior to 1939. ¶ Lowest for year.
† Prior to April 29, 1939, data did not include stocks at terminals, in transit, etc., except in California.
⊙ Available data for year ago include only stocks at refineries, and not at terminals, in transit, in pipe lines, except in California. Those stocks on June 25, 1938, totaled 24,236,000 barrels, and comparable stocks on June 24, 1939, totaled 24,348,000 barrels, or 0.5% more.
+ Available data for year ago include only stocks at refineries, and not at terminals, in transit, in pipe lines, except in California. Those stocks on June 25, 1938, totaled 112,713,000 barrels, and comparable stocks on June 24, 1939, aggregated 107,475,000 barrels, or 4.7% less.



This section deals with the special corrosion problems of the Oil industry—such as those resulting from handling sulfur bearing oils at high temperatures and pressures. Check with your Crane Representative on the performance you are getting from valves in such service.

Two weeks ago, a new and shining valve. Today, a veteran—still shiny, but unfit for service—crippled by corrosion!

Whether or not corrosion destroys your valves with such rapidity, it is a menace to them nevertheless. Corrosive action is present, to some degree, in practically every industrial fluid processing system. Its toll is told in the piping maintenance budget.

Combating corrosion is not a simple task. The answers to its problems are not found in the back of any book. Yet, if your Crane Representative has shown you a copy of Crane's new book on corrosion in piping, you know that there is available the basic information which leads to control of this destructive force. And you may appreciate the broad experience, the elaborate field and laboratory research upon which the data contained in this treatise is based.

But even more important to the valve user, is that the same thorough knowledge of corrosion reflected in this study, is applied in the making of Crane valves and fittings—that Crane-Quality in piping materials represents the finest developments of alloys for specific service conditions.

Crane promises no panacea for corrosion—there is no such thing. But with the engineering knowledge and experience that back the facts in "Combating Corrosion In Industrial Process Piping," with unmatched research and plant facilities, Crane assures you of dependable flow control at minimum cost. Consult your Crane Representative.

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of 60,000,000 barrels by September 30, we could look forward to continued prosperity in the oil producing states throughout the coming winter."

The basis for the reported decline in stocks was the data and statistics from THE OIL WEEKLY. The statement indicates that there is no prospect of increasing allowables for Texas oil wells during the coming winter.

Gasoline tank car cut is chief price change

Prices were mostly unchanged throughout the industry during the past week, although there was further evidence of an unsettled gasoline market.

Socony-Vacuum Oil Company, Inc., effective July 6 made a reduction of 2/10 cent a gallon in its tank car prices for all grades of gasoline throughout New York State and New England, except western New York.

The reduction was explained as due to the lowering of postings on the Gulf Coast to the North Atlantic seaboard.

U. S. motor gasoline at Oklahoma refineries ranged last week about as follows: 62 octane and below, 4¼ to 4⅝ cents a gallon; 63 to 66 octane, 4½ to 4⅞ cents; 67 to 69 octane, 4¾ to 5⅛ cents; 70 to 72 octane, 5 to 5⅜ cents.

Corresponding prices in the Chicago market were: 4 to 4½ cents, 4⅜ to 4½ cents, 4½ to 4⅞ cents, and 4½ to 5¼ cents.

In East Texas, 60-62, 400 end point gasoline was priced generally at 4¼ cents a gallon.

Natural Gasoline

Natural gasoline, grade 26-70, was selling in the Mid-Continent markets, f.o.b. refineries, at 2¾ cents a gallon, and sales were reported at the same price f.o.b. Breckenridge, Texas.

Kerosene prices f.o.b. Oklahoma refineries ranged from 3¾ to 4¼ cents a gallon for the 41-43 water white grade, and from 3⅞ to 4⅝ cents for the 42-44 water white grade; and corresponding prices in the Chicago market were 3½ to 4⅛ cents and 3⅝ to 4⅜ cents.

Prices of fuel oils were generally unchanged last week. In the Chicago market range oil was priced from 3¼ to 3⅞ cents a gallon. The No. 1 white oil was priced from 3¼ to 3¾ cents, and No. 1 straw from 3¼ to 3½ cents. No. 2 straw was 3⅛ to 3½ cents. No. 3 oil was 2⅞ to 3⅛ cents. No. 5 oils were 57½ to 65 cents a barrel. The No. 6 oil was quoted at 35 to 45 cents.

East Texas "blessed" oil about used up

Stocks of confiscated crude and semi-refined oil products acquired during the latter part of 1938 by East Texas refinery operators through sales authorized by the Attorney General of Texas will be depleted in about 6 weeks. Approximately 1,250,000 barrels of miscellaneous products, derived from illegally produced crude, were held by a few plant owners when the confiscated oil sales were abolished last January. Gerald Mann, who is serving his first term as attorney general, has refused to renew the practice of confiscating hot oil to enable the owners to market same within the state.

An upturn in the local refinery demand for legally produced oil is already evident. The complete elimination of the confiscated material will place all refineries on an equal footing in competing for interstate and intra-state sales of refined products. Plants engaged in processing products that can not qualify for federal tenders are selling third-grade motor fuel currently at ¾ to 1 cent per gallon below the quotations of those using legally produced crude. Approximately 6900 barrels of confiscated products are included in the 28,000 barrels of daily average runs credited to local refineries the past week.

Pipe Line News

Four hundred mile Rocky Mountain line

Stanolind Pipe Line Company will seek contractors' bids shortly for the construction of a 420-mile eight-inch crude line to extend from Fort Laramie station on its Salt Creek-Freeman, Mo., trunk line system to Salt Lake City, Utah, where deliveries will be made to the Utah Refining Company's plant.

Aerial survey of the route to be followed by the line through the mountains has been completed. Preliminary specifications have been drafted and submitted to contractors that are likely to bid on the line construction.

Four main line stations are scheduled to be built between Fort Laramie and Salt Lake City. The company has a surplus of pumping capacity on its combination 10-inch and 12-inch line at Fort Laramie.

Utah Refining Company is a subsidiary of Standard Oil Company of Indiana, and has been utilizing tank cars in supplying its Salt Lake City plant with crude.

Stanolind to build line from Bullock to Cayuga

Stanolind Pipe Line Company will award construction contract next week for laying a 35-mile extension from Bullock station, near Mexia, Texas, on its Mid-Continent-Texas City trunk line, to the Cayuga field. The line will comprise 19 miles of 6-inch and 16 miles of 8-inch pipe, with a maximum capacity of 12,000 barrels daily, and is scheduled to be in operation by mid-August.

The Cayuga unit will transport crude purchased by the Pan-American Refining Corporation, which is affiliated with Standard Oil Company of Indiana, and deliver the oil to the former's refinery and tanker terminal at Texas City. Cayuga field's 252 oil wells have a base allowable of 17,320 barrels daily during July, but production holidays will cut the average to 12,857 barrels daily.

Pan-American Refining Corporation has been purchasing all oil produced in Cayuga since February 15, excepting controlled production held by Tide Water Associated Oil Company and 8 high gravity oil wells owned by Roeser-Pendleton, Incorporated. Pan-American Pipe Line Company acquired the Tidal Pipe Line Company's field gathering system and is currently delivering its runs to The Texas Pipe Line Company for common carrier shipment to Texas City for 12½ cents per barrel.

Stanolind Pipe Line Company has ample tankage available in the Mexia district to accumulate the Cayuga asphalt base crude to alternate shipments with East Texas oil.

Standard of Indiana surveying gasoline line

Standard Oil Company of Indiana is making preliminary surveys for a gasoline line from its Sugar Creek refining plant, near Kansas City, to Council Bluffs, Iowa, 180 miles. The carrier under consideration will be welded line whose size will be determined later.

Construction of the line would give the area two gasoline transportation systems, as the Great Lakes Pipe Line Company follows the indicated route for a part of its mileage between Kansas City and western Iowa. The Great Lakes system originates in Oklahoma and ends at Minneapolis. Recently the Missouri River has come into use for gasoline transportation from Kansas City northward.

Buy boosts Ohio Standard's line system to 2000 miles

Recent acquisition of the 450-mile crude oil pipe line from Stoy, Illinois, to McKelvy station, just across the Ohio line in Pennsylvania, by Standard Oil Company of Ohio from Tide Water Pipe Line Company brings the former company's pipe line holdings to 2000 miles of line.

All lines now held by the company and its subsidiaries were acquired or constructed during the past 9 years, as prior to 1930 the company did not buy directly from producers but obtained its crude in Oklahoma through companies that transported through other lines. The company's crude requirements are now obtained mainly in Illinois, Michigan, Kentucky, Ohio and Indiana, transported through 1800 miles of crude lines, by river barge on the Ohio River, and by tanker on the Great Lakes. Two hundred miles of the company's line are gas lines.

Illinois completes short line in East Texas

Illinois Pipe Line Company has completed a 4-mile 4-inch crude line extension from its Mason station, located in the south end of the East Texas field, to connect with Shell Pipe Line Corporation's 10-inch trunk line. The short line is delivering at an average rate of 2000 barrels daily the 182,000 barrels of storage oil recently sold by Ohio Oil Company to Shell Oil Company, and will also handle 650 barrels of daily crude runs contracted by the latter for the remainder of this year.

Magnolia Petroleum Company has

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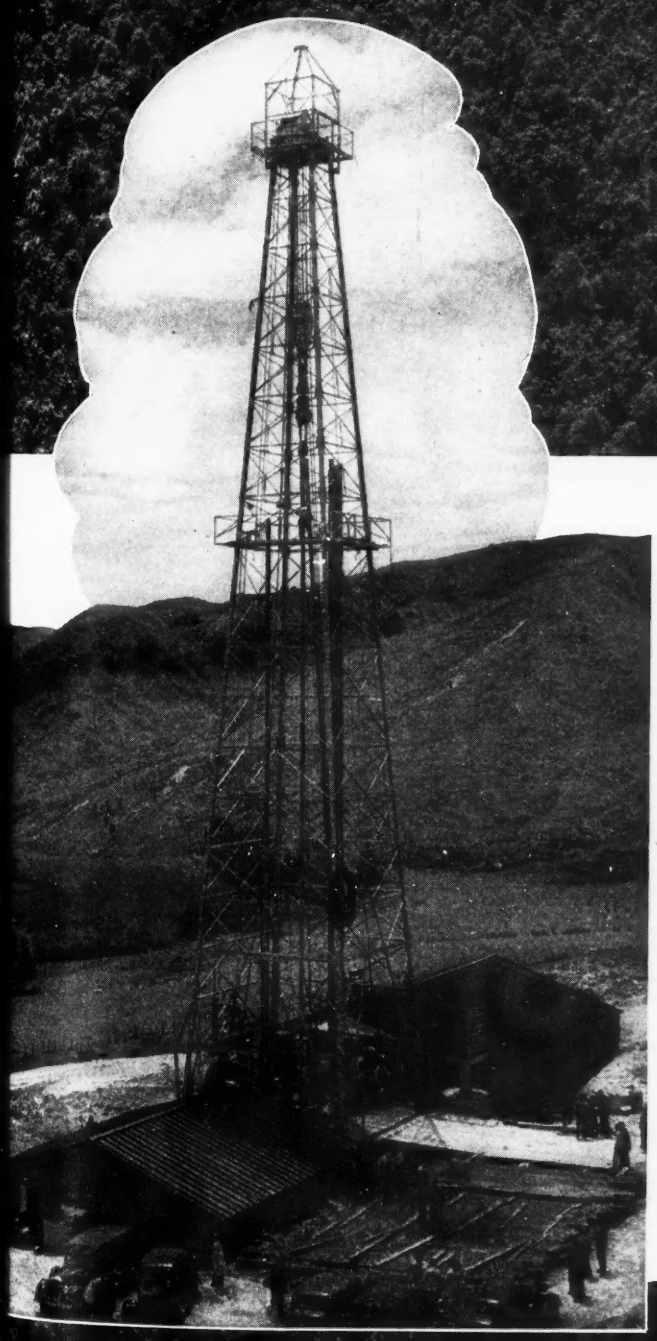

Did you ever notice the high percentage of remote wildcat locations that are drilled with Parkersburg Derricks . . . and, if so, did you ever stop to wonder why? Here's the logical answer:

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contracted to purchase 360,000 barrels of East Texas crude from Tide Water Associated Oil Company, deliveries to be made at rate of 3000 barrels daily.

The Magnolia Petroleum Company is credited with having lately absorbed additional well connections in the field, as the short production week proration schedule has reduced its supply of this particular grade of oil below requirements.

Sohio takes over Illinois Pipe Line's Patoka system

The gathering system of the Illinois Pipe Line Company in the Patoka district of Marion County was taken over July 1 by Sohio Corporation. Officials of the purchasing company announced it would continue to receive oil from the wells connected with the system in accordance with division orders heretofore executed in favor of Ohio Oil Company at the posted field price of $1.05 per barrel.

Cathodic unit on Guadalupe line

The Texas-New Mexico Pipe Line Company has recently completed the installation of a M-G type cathodic unit rated at 20 volt, 80 amperes, on its San Marcos-San Antonio 6-inch line. The unit is located on the E. Voigt property, R. Ximenez Survey, Guadalupe County, Texas.

Crude Production

United States crude output increases to 3,511,825 barrels, but still is within recommended figure

Production of crude oil in the United States during the week ended July 8 was at the rate of 3,511,825 barrels daily. Sizeable gains in Texas, California, Oklahoma, and Illinois were only partially offset by small decreases elsewhere as the nation exceeded the previous week's production by 49,575 barrels daily. For the fifth, and possibly the last, consecutive week output was less than Bureau of Mines estimate of demand for domestic crude, the margin was only 1375 barrels.

Recent completions raised the Texas total to 1,341,450 barrels daily, a gain of 9700 barrels over the week before. Producers did not take advantage of their full allowable, running 25,708 barrels daily less than state allocation, and 85,050 barrels less than bureau estimate.

California ran 603,200 barrels daily to tanks to top the previous week's average by 10,200 barrels, the producer's self-imposed allowable by 8200 barrels, and the federal recommendation by 8000 barrels.

Oklahoma production climbed to 464,425 barrels daily to exceed the preceding week by 12,475 barrels. The unchanged state allowable was over-run by 36,425 barrels and the bureau forecast by 8325 barrels.

Louisiana yield picked up 3450 barrels in moving to the 271,850-barrel mark, where it was 7687 barrels over state allowable and 7350 barrels over federal figures.

Illinois strengthened its bid for Louisiana's place in the production column with an increase in output of 10,075 barrels. At the 243,250-barrel mark production was 55,850 over the bureau's recommendation.

Kansas output at 167,550 barrels daily was 1550 less than that of the week before but 1670 and 7250 barrels, respectively, over conservation limit and government forecast.

Tulsa exposition space being assigned for 1940

August 15 has been set as the deadline for exhibitors to take up their option on space for the May 18 to 25, 1940 International Petroleum Exposition. Contracts have been sent to all past exhibitors, Wm. B. Way, general manager, said.

Considerable requests for additional space by past exhibitors have already been made and some 50 firms never exhibiting here before have asked to be placed on the waiting list.

United States Crude Oil Production

Estimates Compiled by THE OIL WEEKLY

DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (July)	State Allowable in July	BARRELS DAILY FOR WEEK ENDED July 8	July 1
TEXAS—				
Texas Panhandle			69,450	69,900
North Texas			86,900	86,450
West Central Texas			32,550	32,050
West Texas			219,950	218,050
East Central Texas			95,800	93,050
East Texas Field			385,500	387,500
South Texas			229,900	226,550
Texas Gulf Coast			221,400	218,200
Total Texas	1,426,500	1,367,158*	1,341,450	1,331,750
CALIFORNIA—				
Long Beach			48,100	45,100
Santa Fe Springs			28,600	27,700
Huntington Beach			26,000	23,500
Dominguez			18,000	17,600
Ventura Avenue			36,900	38,800
Midway-Sunset			47,700	46,600
Kettleman Hills			51,500	59,700
Wilmington			82,000	81,000
Others			264,400	253,000
Total California	595,200	595,000†	603,200	593,000
OKLAHOMA—				
Oklahoma City			103,900	90,800
Seminole Area			103,325	113,575
Fitts			26,350	25,200
Others			230,850	222,375
Total Oklahoma	456,100	428,000	464,425	451,950
LOUISIANA—				
North Louisiana			72,350	71,650
South Louisiana			199,500	196,750
Total Louisiana	264,500	264,163	271,850	268,400

DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (July)	State Allowable in July	BARRELS DAILY FOR WEEK ENDED July 8	July 1
ILLINOIS—				
Salem			131,900	129,650
Loudon			51,900	47,125
Other New Pools			52,450	49,550
Old Pools			7,000	6,850
Total Illinois	187,400		243,250	233,175
KANSAS—				
Burrton-Haven			9,900	9,975
Russell County			25,600	23,350
Silica			10,500	10,975
Others			121,550	124,800
Total Kansas	160,300	165,880	167,550	169,100
NEW MEXICO	116,100	116,100	110,850	113,250
EASTERN STATES—				
Pennsylvania Grade			71,250	71,300
Others, Eastern			5,850	5,900
Total Eastern States			77,100	77,200
MOUNTAIN STATES—				
Wyoming	73,200		66,200	61,050
Montana	16,100		15,200	15,550
Colorado	4,800		4,000	4,100
Total Mountain States	94,100		85,400	80,700
MICHIGAN	53,200		68,650	66,750
ARKANSAS	53,900	61,117	60,100	59,000
KENTUCKY	15,900		14,500	14,325
INDIANA	2,600		3,500	3,650
Total United States	3,513,200		3,511,825	3,462,250

* Daily average, considering Saturday-Sunday shutdowns, water exemptions, and exemption at Rodessa.
† Recommendation of Central Committee of California Oil Producer's Association.

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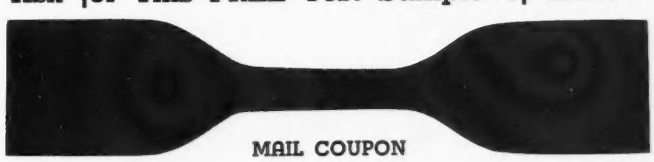

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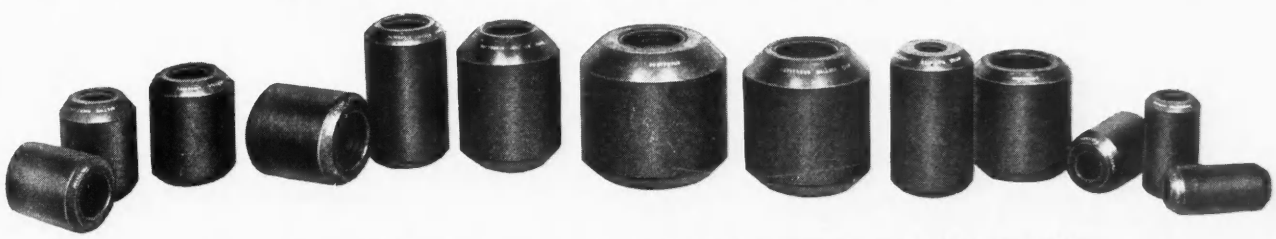

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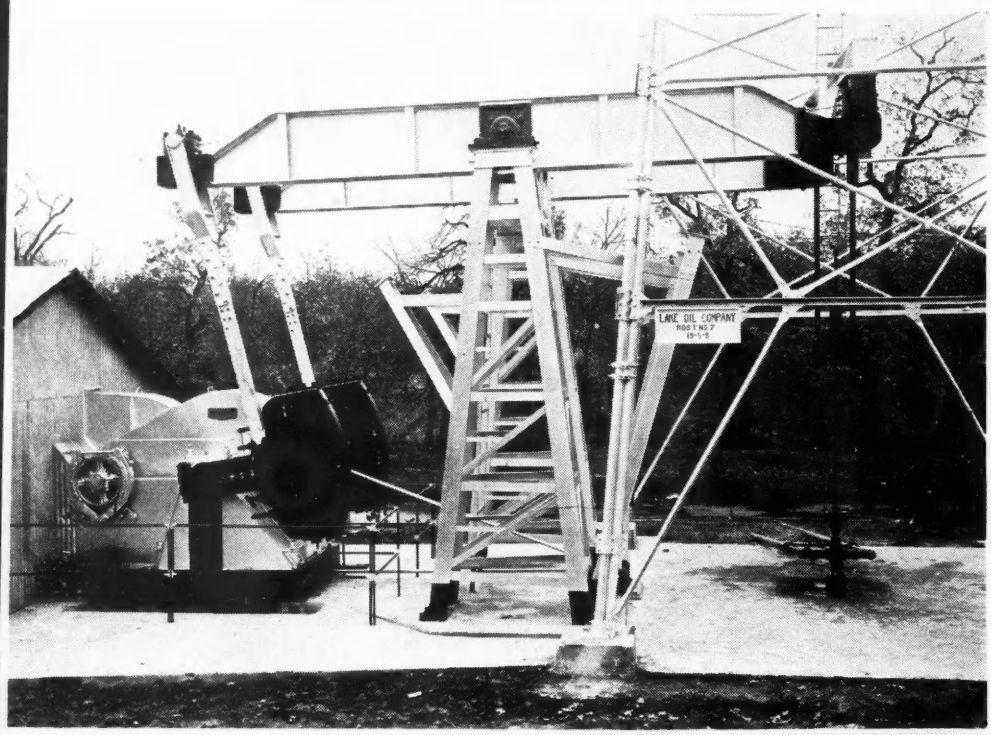

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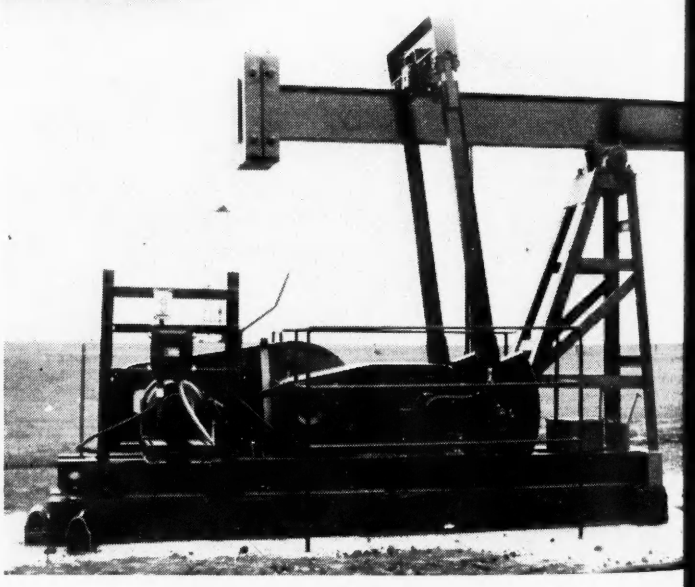

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WEEK'S DRILLING HIGHLIGHTS

Rocky Mountains

With elevation of 9325 feet, a Divide Creek wildcat, Mesa County, Colorado, was only 1175 feet below sea level as it passed the 10,500-foot depth to set a new Rocky Mountain deep drilling record. In Wyoming, rotary contract has been let to drill the Geary structure, 10 miles north and east of Casper. In Montana, Cut Bank was extended three quarters mile northwest with its third Sunburst sand completion among some 400 Cut Bank completions.

Arkansas

Third successful well in the new field in Lafayette County apparently is the area's best to date. Columbia County wildcat shows trace of oil in the Cotton Valley series and is drilling on for the Smackover lime.

North Louisiana

The fourth gas-distillate producer at Bear Creek, Bienville Parish, is a mile extension. On the newly found salt dome in Tensas Parish, operators plan another test after drilling into the salt.

South Louisiana

Lafourche Crossing may be an oil field, gas-distillate sand having been logged in a wildcat there. Eola, Avoyelles Parish, was extended northwest by a 271-barrel well. New sands are being tested north of production at Bancroft, Beauregard Parish. Quarantine Bay, Plaquemines Parish, got a new sand when a well did 238 barrels from 8552 feet.

Kansas

Misener sand was proven productive at Medicine Lodge, Barber County, hitherto productive of oil only from Viola lime. Kansas City lime was commercially productive for the first time at Silica, Rice County.

Although yet uncompleted, the Cowley strike that flowed 18 barrels an hour after penetrating Arbuckle lime a foot has drawn 2 competitive tests. A wildcat 3 miles north of Otis continues to show Arbuckle oil. A potential of 310 barrels was established for the mile northeast extension of Silica, Rice County.

Kentucky

Five feet of McClosky saturation near Beech Grove indicated a new pool for McLean County. Utica pool, Daviess County, was extended west.

Texas Gulf Coast

Frio oil was found at 8104 feet on Martha prospect and Esperson field, also in Liberty County, got a new deep flank sand. Cheek, Jefferson County, was extended 3500 feet southeast. Clear Lake, Harris County, was extended 2000 feet southwest.

California

Coles Levee, Kern County, was proven one of the major fields of San Joaquin Valley floor by completion of a northwest extension well at 9216 feet for 2200 barrels of 56-gravity oil and 30 million feet of gas.

North Texas

A mile extension to Hull-Silk field, Archer County's most important Strawn-sand area, promises stimulation of development. A west offset to the discovery well of Nocona field, Montague County, was rated at 35 barrels. Walnut Bend pool, Cooke County, got a new pay when Simpson lime proved productive.

Illinois

Franklin County was brought into the basin play when a wildcat in Ewing Township pumped 199 barrels of St. Louis lime oil. Completion of the confirmation well for the deep Niagaran lime strike near Sandoval, Marion County, presaged great possibilities for deep drilling in the basin. The state's first directional well was completed under Lake Centralia, where the state's record producer was completed for 7344 barrels of McClosky oil.

Comparison of Permits Granted for New Wells

STATE	Week Ending July 8	Total this Mo.	Total this Year	Total this Date Last Year	1938 Year Total
Arkansas	7	7	121	135	247
California	25	25	532	647	1,146
Louisiana	33	33	655	700	1,214
Kansas	24	24	774	834	1,453
Michigan	26	26	685	396	953
Oklahoma	54	54	1,100	1,081	1,978
Texas	167	167	5,555	7,268	12,369
Total	336	336	9,258	11,061	19,360

Summary of Wells Completed in the United States Week Ending July 8, 1939

	Completions	Oil Wells	Gas Wells	Failures	Initial Production	Total 1939	Total This Date 1938
Alabama	....	....	....	....	.....	1	2
Arkansas	6	6	....	....	3,210	119	122
California	19	19	....	....	19,242	545	656
Colorado	1	....	....	1	.....	12	5
Florida	....	....	....	....	.....	....	....
Illinois	73	63	1	9	37,640	1,907	558
Indiana	2	1	....	1	300	86	55
Kansas	28	19	....	9	43,271	688	934
Kentucky	11	4	1	6	190	315	379
Louisiana	15	7	1	7	.....	3,380	570
Michigan	28	18	2	8	8,975	722	437
Mississippi	....	....	....	....	.....	4	10
Montana	4	3	....	1	213	62	27
Nebraska	....	....	....	....	.....	....	1
New Mexico	10	10	....	....	2,669	325	274
New York	13*	13*	....	....	26	256*	401*
Ohio	22	5	11	6	132	455	490
Oklahoma	46	30	2	14	4,955	1,087	1,169
Pennsylvania	30*	30*	....	....	46	703*	1,264*
Texas	244	159	7	78	98,839	5,151	6,998
Utah	....	....	....	....	.....	....	1
West Virginia	11	....	10	1	.....	248	374
Wyoming	....	....	....	....	.....	66	50
Total this week	563	387	35	141	222,998	13,275†	14,679†‡
Total last week	565	390	43	132	216,109	12,712†	14,236†‡
Total this year	13,275†	9,063	935	3,276	10,946,000	....	....

* Includes water-input wells. † Includes 1 Georgia completion. ‡ Includes 2 Tennessee completions.

Oklahoma Fields

Offset to Hobart discovery not showing where expected

Status of new Carter County strike still in doubt.

Oklahoma Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Caddo County—		
Palmer, Dixon 3 ne nw sw nw 35-6n-10w	200	3471
Comanche County—		
King, Culbertson 2, ne nw ne 32-2n-10w	3	515
Creek County—		
Atlantic, Kimball 2, ne sw ne 16-14n-10e	64	3360
Curtis, Hughes 1, ne sw nw 21-16n-10e	*	2927
Strozier, Bierly 7, se sw sw 12-16n-11e	35	1778
Baker 1, ne se nw 20-17n-9e	150	2546
Willoughby, Brown 1A, w½ sw sw sw 31-18n-10e	10	1850
Grady County—		
McCasland, Horton 3, sw nw se 8-3n-5w	40	2790
Jackson County—		
Kerbo & Britton, Leona 2, nw se se 31-1n-19w	92	2618
Kiowa County—		
Wichita, Bachelor 1, sw sw se se 14-5n-15w	*	151
Muskogee County—		
Parks, Duncan 1, ne se se se 20-14n-19e	*	1205
Mussellem, Evens 6, ne se sw 32-14n-19e	*	1495
Howard & Howard, Jefferson 2A, nw sw nw 33-15n-15e	95	1351
Okfuskee County—		
Johnson & Big Chief, Lehmer 1A, csw ne 3-11s-9e	*	4022
Okmulgee County—		
Browning & Potter, Bradford 1A, near csw 10-13n-13s	*	2782
Castleman, Flint 5, sw nw ne 25-14n-14e	5	1112
Hinds, Barnett 4, sw ne sw 6-14n-15e	4	690
Misener, Jefferson 2A, ce½ sw sw 22-15n-14e	¶1/3	867
Karam, Fields 2A, se se 21-16n-14e	50	1763
Osage County—		
Nafel & Lebow, 13, se se sw 19-25n-9e	20	2304
Payne County—		
Amerada & Stanolind, Fruin 2, ce½ sw nw 12-17n-1e	540	4890
Magnolia, Cain 3, cw½ ne sw 12-17n-1e	530	4863
Mulberry, Broyles 8, cn½ ne nw 26-18n-4e	¶5	3878
Pontotoc County—		
Phillips, Norris 1, ne se sw 25-2n-6e	39	4430
Simpson et al, Statler 3, sw se sw 34-2n-7e	265	1864
Walker, King 1, sw se nw 5-4n-7e	*	1203
Sandback, Miller 1A, sw se sw 27-5n-6e	*	1512
Osborn, Harris 1, sw ne nw 33-5n-7e	84	2271
Pottawatomie County—		
ITIO, Lambert 1, ce½ nw ne 6-5n-2e	*	5716
Denver P. & R., Schrader 2, ne se ne 1-6n-4e	700	4136
Giblin et al, Walker 1A, ne se sw 7-7n-4e (owdd)	96	3964
Phillaine, Garrett 1, ne se nw 28-7n-4e (owdd)	50	4226
Berkey et al, Thomas 1, se sw se 29-7n-4e	75	4306
Big Chief, Green 1, nw sw sw 29-7n-5e	273	4203
Sinclair, Gammon 7, se sw nw 30-7n-5e (owdd)	24	4353
Watchorn, Vanselous 2A, cs½ ne se 32-7n-5e	200	3166
Berkey, Dowell 1, sw ne nw 33-8n-4e	*	4614
R. Olsen, Gillis 2, sw nw nw 5-10n-4e	650	4451
Alma & K.G.F.F., Benesh 1, se se nw 3-11n-6e	*	4809
Seminole County—		
Wood, Tobin 2, sw nw nw 22-7n-5e	190	2781
Villines, Reed 2, se ne ne 35-7n-5e	75	3016
Cities Service, Fish B-4, se ne se 19-7n-8e	321	4185
Wood, Helm 1, nw se nw 27-9n-5e	*	4418
Tulsa County—		
Johnson, Fee 2, sw ne nw 5-17n-14e	75	1558
Eppler, Boland 1, sw sw ne 18-18n-14e	*	1525
Abe Pepis, Bishop 2, sw se sw 35-19n-12e	*	2070

*Failures; †Junked; ¶Mil. cu. ft. gas.

Tulsa.—Pool discoveries and extension wells in Oklahoma went through another week with question marks still in place.

At the end of the week the west offset to the discovery well of the Hobart field, Kiowa County, was at a depth expected to pick up Viola lime production but not showing. Shell Oil Company drilled to 1053 feet in Ratliff 1, SEc NE 19-7n-17w, and is lowering 7-inch casing. It is a west offset to Watkins 1 of Gled Oil Company, which was rated at 100 barrels an hour, 5 feet in Viola lime, total depth 1055 feet.

The Shell Oil Company well had gas showings between 740 and 810 feet, a condition not found in the Watkins discovery, SWc NW 20-7n-17w.

Additional gas showings were encountered in drilling to level where Viola lime saturation was expected.

The Watkins discovery came in in May when it started flowing through casing. It had to be killed before casing could be cemented. Its output has been estimated at 10,000 barrels, some of which went into pits. Since being tubed it has been tested but has not been produced because of no outlet.

Another test for the Hobart area was assured last week following sale of leases by the Oklahoma School Land Commission. Lewis & Meyer Drilling Company got the lease on W½ SW, Section 13-7n-18w, conditioned on starting a well within 90 days. This lease is about 2 miles west of the discovery.

Five other leases covering 400 acres of additional school lands in the area were sold.

Completion Delayed

Another week of testing has failed to bring completion for the Carter County wildcat of Pure Oil Company, Noble 1, C NE SE 35-3s-1e, which is flowing and swabbing from Sycamore lime, perforated between 4150 and 4234 feet. After standing it flowed 55 barrels by heads in 1 hour and 15 minutes. In the next 12 hours it made only 15 barrels by heads. Equipment is being installed to swab. The well was drilled to Arbuckle lime, which yielded salt water, as did the Viola. It is standing with 3400 feet of fluid in the hole.

Swabbing tests were continued in the Cleveland County wildcat of Nels Burton and associates, Boggs 1, NEc SE 16-9n-2w, which is making 10 barrels of fluid an hour, part acid and drilling water. About 500 barrels of oil have been picked up from the pits from a week of swabbing the fluid from the Simpson dolomite, 7473 feet.

The first producer in the area, Burton et al's Norman 1, NWc NE 17-9n-2w, was opened last week and flowed 325 barrels before going dead. This well also tapped the dolomite through perforations between 7540 and 7550 feet. It has been testing for several months, part of the time on bottom hole pump.

Three miles southeast of the above wells Hall & Briscoe, Incorporated, are below 5500 feet in Mantooth 1, NWc 24-6n-1e. North of this wildcat, Sinclair Prairie Oil Company is rigging up Ward 1, SEc 30-7n-1e.

Water encroachment came into the second well of the Calvin field, Hughes County, shortly after Phillips Petroleum Company completed Shemwell 1, C SE NW 8-5-10e, in Viola lime between 5568 and 5595 feet. In flow last week it made 66 barrels of oil by heads and some water. It had sufficient gas to build up a pressure of 1000 pounds before being opened. This well is ¼ mile northeast of the Beeker discovery, a Phillips Petroleum Company wildcat which went to the Wilcox sand and was plugged back to 5660 feet, where it has been making both oil and water through submersible pump for several months. A mile to the southeast W. A. Delaney is starting work on Foster 1, NW NE NE 17-5n-10e.

To Test Wildcat

The Grant County wildcat of Carter Oil Company, Staggers 1, C S½ SE NW 4-25n-3w, north of the Lamont pool, has casing set at 5417 feet, depth being 5528 feet. Tests will be made when plugs are drilled. In the same county Herndon et al's State 1, C SE SW 16-25n-4w, drilled to 6205 feet in Wilcox sand, took electrical logging test and shut down.

The deepest well in Oklahoma history passed 13,200 feet last week. It is the Washita County test of Continental Oil Company, Proctor 1, C NW 28-10n-20w.

In Kingfisher County Anderson-Prichard Oil Corporation had rigged up for Geis 1, C NE SW 15-18n-9w, to test a block of 7000 acres.

Commercial production for the Carter County strike of two weeks ago continued doubtful. Pure Oil Company produced 165 barrels by swabbing Noble 1, C NE SE 35-3s-1e, Carter County. The wildcat is producing through perforations between 4150 and 4234 feet. It was carried to Arbuckle lime, 8485 feet, which tested salt water. Perforations found the Viola lime to carry salt water. At the upper level oil is thought to be coming from the Sycamore lime.

Second for Calvin Pool

Second well for the Calvin pool, Hughes County, Phillips Petroleum Company's Shemwell 1, C SE NW 8-5n-10e, a quarter of a mile northeast of the discovery well, continued to test with indications that its output will be similar to the Beeker discovery. It has made several flows by heads from Viola lime between 5568 and 5595 feet.

First perforations in the Wilcox sand in the Grant County wildcat of Carter Oil Company, Staggers 1, C S½ SE NW 4-25n-3w, brought salt water. First shots were between 5302 and 5313 feet after which salt water rose to within 700 feet of top of the casing. Plug was set at 5297 feet and bailing started so perforations can be made higher in the Wilcox sand section. While drilling this well, three miles north of the Lamont pool, had stains and odors from cores in the Wilcox sand. Structurally the well was 140 feet higher on the Dolomite than the Lamont field.

Kansas Field Developments

Misener sand found productive at Medicine Lodge.

Kansas City lime new pay horizon for Silica field.

Wichita.—Misener sand production for the Medicine Lodge field, Barber County, put that area into the limelight for western Kansas last week. Holmes 3-A of Barbara Oil Company, located in S½ N½ SE Section 15-33-13w, is the second oil well for the field. At 4868 feet, 10 feet in the Misener, it flowed 360 barrels in 8 hours and is yet to be completed.

This well is ¼ mile northwest of a well producing oil from the Viola lime. Gas production is chiefly from the Mississippi lime with some of it coming from the Viola. The area, which has been producing gas since 1926, is controlled by the Barbara Oil Company.

Barber County has 2 other small oil fields, Lake City, 15 miles northwest, with 1 Arbuckle lime well, and Whelan, 8 miles northeast, where 8 wells are producing from Mississippi lime.

Kansas Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Barton County—Stanolind, Stuckemann 7, cn½ sw 11-20-11w,	24	3281
F. Hollow, Andrea 2, ne ne nw 19-20-11w	*	3370
Butler County—		
Rex & Morris, Allen 1, nw sw sw 21-26-7e	40	2757
Nelson 1, ne ne ne 22-28-7e	35	3718
Cowley County—		
Hartman & Blair, Waite 7, sw se nw 21-31-4e	16.045	3351
Waite 8, sw ne sw 21-31-4e	7107	3334
Waite 9, nw se nw 21-31-4e	5985	3380
Ellis County—		
Gulf, H. Mai 4, sw se se 14-11-17w	3500	3392
Shell, Rumsey 18, sw nw ne 23-11-17w	3500	3385
Ellsworth County—		
Continental, Johnson 2, ne ne nw 28-17-8w	2162	3234
Greenwood County—		
Katz, Harrington & Veedor, Olson 2, sw ne se 2-25-8e	25	2305
Harvey County—		
Alyard et al, Wiley 1, cs½ ne 18-23-3w	671	3374
Kingman County—		
Skelly, Miles "F" 1, cn½ nw 20-27-10w	*	4320
Pawnee County—		
Texon & Simpson, Nelson 1, ne ne se 14-20-16w	354	3806
Reno County—		
Westgate-Greenland, Haggerty 2, se se nw 36-22-5w	*	3936
Rice County—		
Continental, Poland 2, nw se se 30-18-7w	778	3225
Lewis A 3, ne sw nw 13-18-8w (salt water disposal)		3716
Lauck & Moncrief, Schoonover 1, sw sw se 20-18-9w	*	3304
Garden et al, Willard 1, nw sw sw 6-19-9w	295	3263
Lario, Link 1, se se sw 17-19-9w	*	3285
Ingling, Pool 1, cne sw 2-20-8w	*	3397
Russell County—		
Cities Service, Dudd 1, nw nw se 18-13-14w	241	3134
Coralena, Sellens 5, se sw se 29-15-13w	1940	3306
Phillips, Mollie 3, cne 35-15-14w	521	3375
Coralena, Deines 13, ne sw ne 36-15-14w	48	3277
Sedgwick County—		
Lauck, Young 1, cs½ se sw 32-28-2e	*	2235
Stafford County—		
Continental, Boland 1, ne ne sw 13-25-13w	*	4175
Sumner County—		
Shawver, Hitchcock 1, cn½ ne ne 16-30-1w	*	3625

*Failures; †Junked; ¶Mil. cu. ft. gas.

Kansas City lime was added to producing horizons of Silica pool, Rice County, with a potential of 2435 barrels in Finston Company's Hathaway 1, C N½ NW SW Section 27-19-10w. Lime was found between 2950 and 3050 feet. Other production is from Arbuckle lime.

A mile south of Wheery pool, Rice County, Ocker et al found saturation in the Mississippi lime and set casing to test in Bauer 1, E½ SW Section 23-21-7w. Top of the lime was at 3392 feet.

Draws Two Locations

Although the test which last week gave assurance of a new field in Cowley County has not been completed, two additional tests are starting in the area. The wildcat strike is that of Hartman and Blair, Brown 1-A, SEc NW 33-30s-4e, which has casing set in Arbuckle lime at 3280 feet, ready for testing when plug is drilled. It began flowing natural at 18 barrels an hour after penetrating the lime one foot. Carlock and Shaffer have staked location for Starlin 1, NEc SW 27-30-4e, 1¼ miles northeast, and Gulf Oil Corporation is rigging up Raymond 1, NEc SW 33-30-4e, a south offset to the discovery well.

The area is between the Hittle and Rock pools. Recently Hittle has taken the lead in Kansas development through its high potentials from Arbuckle lime wells.

Another well still showing but not completed is the Barton County wildcat of Iron Drilling Company and associates, Pospishel, NEc SE 20-17-15w, which has been drilled to 3564 feet in Arbuckle lime and acid treated. Oil rose 1000 feet in the hole. Previous to settting pipe the well gave encouragement because of a saturated core between 3548 and 3557 feet. The test is three miles north of the Otis field, which produces both oil and gas.

Outpost Disappoints

The first response after drilling plug in the well north of the Chase field, McPherson County, was only 2 barrels an hour. Derby Oil Company and Carey Drilling Company drilled Link 1, SW NW NE 19-19-9w, to 3285 feet in Arbuckle lime. Only 100 gallons of acid was used in the first test. Later 500 gallons of acid was added.

An effort will be made to get Kansas City Lansing lime production from a test a mile west of production in the Prusa pool, Barton County. Vernon Oil & Gas Company and associates found saturation between 3207 and 3214 feet. Oil rose 500 feet in the hole between the depths. The hole is being underreamed to lower casing for a test.

Two offsets have been started around the recent westward extension for Pawnee Rock, Pawnee County. Stanolind Oil & Gas Company and Amerada Petroleum Corporation are drilling Belt 1, NWc SW 13-20-16w, an east offset to the extension, Nelson 1 of Texon Oil Company and Simpson Oil Company, which moved production ½ mile west. These partners have started a north offset to the extension, Dirks 2, SEc NE 14-20-16w.

A potential of 310 barrels was established for the extension well a mile northeast of production in the Wilica pool, Rice County. Central Petroleum Company and Associates drilled Dipple 1, NEc SE 27-19-10w to 3313 feet in Arbuckle lime. Skelly Oil Company and associates have staked location between this well and the pool, Bernstorf 1, C S½ SE SE 22-19-10w.

Location has been made by Continental Oil Company for Keller 1, SEc 15-24-13w, ½ mile northwest of production in St. John pool, Stafford County.

Three quarters of a mile west of production in the West Ellinwood pool, Barton County, Crown Petroleum Corporation and associates have a location, Schartz 1, SEc NW 12-20-12w.

A half mile north of the one well in the Canton North pool, McPherson County, Yeager et al, are rigging up Wilson 1, SE NE 26-18-1w.

Between the Cairo gas pool and Cunningham field, which produces both oil and gas in Pratt County, Skelly Oil Company has a location for Royse 1, C SW 9-28-11w.

43,271 barrels of new oil initialed by Kansas wells

The 18 oil wells in the 31 completions in Kansas last week had a combined initial output of 43,271 barrels of oil. There were 9 dry holes, 1 salt water disposal well and 3 abandoned locations. Only 24 locations were made, with Greenwood and Rice counties having 4 each. Other counties and the number of wells started in each are: Barton, 1; Butler, 1; Cowley, 2; Ellis, 1; Harvey, 1; Johnson, 1; Kingman, 1; McPherson, 1; Pawnee, 2; Pratt, 1; Russell, 1; Sedgwick, 1; and Stafford, 1.

Duggan to be drilled on 17½-acre units

Operating rules for the Duggan Field, Cochran County, which were issued by the Texas Railroad Commission last week, provide for spacing in the center of 17.8 acre units. This allows wells to be drilled 440 feet from lease lines and 880 feet apart.

However, the following wells were exempt: "The east-west distance of 660 feet between the two wells previously completed in this field 330 feet east and west, respectively, and 660 feet north of the southwest corner of Labor 13, League 55, Oldham County school land, is hereby expressly exempted from the above requirement . . ."

The regulations call for proration on acreage and potential with 75 percent on the former and 25 percent on the latter factor. As much as 35.6 acres may be assigned to one well, in which event the potential allowance remains constant and the acreage allowance for two full units is added.

The rules call for enough surface casing cemented to the surface to shut off all fresh water sands and an oil string cemented 600 feet above the shoe. A maximum gas-oil ratio allowance of 2000/1 is provided.

Illinois Developments

Producing wildcat brings Franklin County into play.

Deep Niagaran lime pool near Sandoval to be busy.

Mattoon, Ill. — Gulf Refining Company's E. B. Hineman 1, SE SW NE Section 19-5s-3e, Ewing Township, Franklin County, pumped 199 barrels of oil and 7 barrels of water in its initial test from the St. Louis lime. Before deepening to the St. Louis, the wildcat had swabbed 48 barrels of oil from the McClosky in a 24-hour period. Six miles from nearest production, it brings Franklin County in the Illinois Basin oil play. A single well near Ina, south Jefferson County, is the only production in the immediate vicinity.

Illinois Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Bond County—		
Eason Oil Co., Land Bank 1A	*	1155
Clark County—		
Brann et al, Baughnan 1	*	1027
Clay County—		
Pure, Schott 7	600	3109
Travis 2	160	3075
Moseley 3A	58	3055
Stanford 1	772	3090
Clinton County—		
W. C. McBride, Keister 1	*	1476
Crawford County—		
Soard Oil Co., Snyder 1	*	1385
Fayette County—		
Carter, Goodson 4	117	1583
Goodson 5	256	1568
Leona 2	210	1586
Mills 3	644	1559
Coddington 3	288	1523
Hackert 2	91	1571
Hackert 3	480	1552
Feezel 6	225	1558
Feezel 7	377	1552
Ripley 5	330	1553
Ripley 6	400	1545
Reese 6	174	1564
Botterbusch 1	70	1514
Mabee Dr. Co., Kimbrell 2	157	1552
J. H. Vandenbark, Breeze 2	200	1600
Shell, Hugo 4	134	1576
Jedanski 1	106	1570
Fulton 9	200	1583
Millister 4	161	1578
Stewart Oil Co., McPheeters 3	168	1577
Rosenthal, Rush 2	140	1594
Babcock, Rhodes 5	117	1583
Pace-McLean et al, Fee 3	115	1589
Merrick & Apperson, Botterbush 6	20	1508
Oils, Inc., Blurton 7	450	1580
Gallatin County—		
F. R. Jackson, Turner 1	*	2717
Jefferson County—		
Papoose Oil Co., Schweinfurth 1	*	2740
Lawrence County—		
Edward Gieck, Gutteridge 2	*	2280
Young et al, Bierhaus 1-A	¶2.00	782
Marion County —		
Potter Bros., M. & I. 6-A	960	2092
Magnolia, Young 36	2880	2050
Young 38	2880	2070
Young 14	1560	2022
Young 18	288	2030
Shell, Salem Bank 1-A	840	1994
Young Heirs 8	864	1867
W. R. Currie, Young Strip 3	650	1886
Hart & Hart, Young School 2	4200	1986
Texas Co., Chapman 9	1960	1997
Chapman 10	2072	1870
Lee 8	1575	1964
Lee 10	616	1839
Friedrich 2	182	1894
Shanafelt 5	5684	2040
Parker 9	196	1840
Sands 3	322	1865
J. Lickey, Quick 1	*	2050
Richland County—		
Pure, Sparr 1	120	2605
Cozel 3-B	54	2602
Cozel 4-B	221	2612
St. Clair County—		
Wise et al, Tarlton 2	40	541
Washington County—		
Pres. Cochrane & Clyde Murray, Gebhart Roadway 1	*	1305
Magnolia, Francis 7	54	1302
Francis 8	50	1290
Nowak 1	144	1260
Shell, Klozek 2	84	1275
Holston 4	140	1298
Holston 5	41	1290
Wayne County—		
Pure, Clay 1	24	3165
McCracken 1-A	188	3105
Trotter 1	81	3140
Wright 1	555	3095
Rogers 2	300	3095
G. A. Manahan, Fitch 2	200	3107
Carl Robinson, Oakley 1	400	3411

*Failures; †Junked; ¶Million cu. ft. gas.

Two Wildcats Fail

Hopes of bringing Perry County into the oil picture died when G. H. Blankenship announced he was abandoning Rutowski 1, SE SE NE Section 13-4s-2e, near Tamaroa. The wildcat had some saturation, but insufficient to make a producer, in the Benoist, topped at 1257 feet. Decision to abandon came after both the Aux Vases and McClosky were found dry. Blankenship also abandoned Rheinecker 1, wildcat in NW NW NE Section 3-6s-4w, Cutler Township, near Jamestown.

Following completion of a confirmation test for the deep Niagaran lime pool near Sandoval, Marion County, the area appears destined for an extensive development campaign. The confirmation well, completed a week ago, was turned into a 10,000-barrel tank but no production gauge was immediately available. It is Menhall et al's Benoist 1, E NE NW Section 8-2n-1e, bottomed at 2924½ feet. This operator's Benoist 2, 550 feet south of No. 1 and in NE NE NE Section 8-2n-1e, was below 1600 feet and having trouble with caveins. Max Pray's Robinson 1, SW Section 4-2n-1e, ¾ mile due east of the recent completion, was drilling at 900 feet; while ¼ mile east of Robinson 1, Charles Baldwin et al's Schaffnit 1, Section 4-1n-2e, was moving in materials, and 660 feet farther east Kimmel & Taylor's Kennedy 1 had derrick up.

This area was opened 6 months ago by Southwestern Oil & Gas Company's Benoist 21, Section 8-2n-1e, on a lease where 20 wells were producing from the shallow Benoist sand, some for as long as 27 years. Two dry holes drilled to the Niagaran early in the year that resulted in dry holes discouraged further development in the area; but near completion last month of the confirmation test returned this area once more to the spotlight.

Development Important

The Niagaran development is of greater importance because of encouragement it offers to deep drilling in the basin, both in wildcat areas and in present pools where production is being obtained from Benoist sand and McClosky lime. The present wells are on a small structure.

An attempt to extend the St. James pool of Fayette County to the northwest failed when Gifford Drilling Company's Garver 1, SE NW NE Section 25-6n-2e, Otego Township, was abandoned at 1617 feet when too much water was found with the small oil showing in the Weiler sand.

The tenth attempt to bring in a producer near Mattoon failed when Gard S. Marvin et al's J. H. Bell 1, SW SE SE Section 28-2n-7e, southwest of here and in Coles County, was abandoned after drilling to 2250 feet without an oil show. Oil production in Coles County thus far is negligible, comprising one small Cypress sand producer in the Mattoon pool, Section 1-11n-7e, and two small Pennsylvanian sand producers in the Hutton pool in Section 23-11n-10e. Numerous wildcats have been drilled in various parts of the county during the past two years.

In Jefferson County, Magnolia Petroleum Company's Severs 1, Section 22-2s-1e, offsetting this company's discovery well in the Roaches pool, encountered a tight saturation in the Rosiclare sand which may make a well. The discovery is producing from the lower McClosky lime. Bottom was at 2200 feet.

In White County, southeastern Illinois, Superior Oil Company's Sarah Stum 1, SW SW NW Section 15-5s-14w, was drilling below 2175 feet, preparing to core for the Waltersburg sand. Three miles southwest of New Harmony, Indiana, the test is only 1 mile south of this company's Waltersburg sand pool opener on Ribeyre Island, on the Indiana side of the river.

Interest in the deep part of the basin was directed towards Roy Wilson et al's Roy Wilson 1, SE SE SE Section 13-3n-8e, southeast Noble Township, Richland County, which drilled through a dry Cypress sand and was preparing to core the McClosky at 3015 feet.

Jasper County's sole active test was running high. Borah & Thompson's Union Central Life Insurance Co. 1, Section 14-8n-10e, was drilling at 2200 feet after pass-

New York Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Allegany County—		
Childs & Bartoo, Fee farm, West Clarksville	1	1383
O. L. Hatch et al, Fee farm, West Clarksville	5	1364
George Birteil, Elias Cady farm, Wirt	2	1226
Deer Creek Oil Co., Hill farm, Genesee	4	1365
Ella Oil Co., Crandall farm, Bolivar	5	1332
Rice, Welch & Jordan, Peterson farm, Wirt	4	1366
Reeland Oil Co., Swarthout farm, Genesee	5	1350
Allegany: Water Intake Wells		
Ada M. Gray, Smith & Gray farm, Genesee	...	1372
Karl & Weller Oil Co., J. M. Karl farm, Genesee	...	1340
Cam Oil Co., Peavy farm, Genesee	...	1335
Cleveland Oil Co., Clemens farm, West Clarksville	...	1370
Martin O'Connor Estate, O'Connor farm, Genesee	...	1340
Tress Oil Co., Northrup farm, Bolivar	...	1435

Pennsylvania Completions

Bradford District

Brink & Brink, 268 Bing	2	....
First Nat'l Bank, Port Allegany, Fee	5	....
Pure Penn Oil, Inc., Kinley	15	....
Forest Oil Corp., 4 wells	4	....
Forest Petroleum Corp., 3 wells	3	....
Niagara Oil Corp., 6 wells	6	....
Bradford Transit Co., 9 wells	9	....
Bradford: Water Intake Wells		
H. & H. Oil Co., Moody	...	....
Forest Oil Corp.	...	....
Niagara Oil Corp., 4 wells	...	....
Butler-Armstrong District		
McKee & Pollock, J. D. McKee	1	....
Middle District		
Clinger Oil & Gas Co., Haight	1	....

*Failures; †Junked; ¶Mil. cu. ft. gas.

ing through a dry Cypress sand. It was to enter the McClosky lime late in the week.

The first directional well to be drilled in Illinois was successfully completed last week when The Texas Company's City of Centralia 31, started on the edge of Lake Centralia, the city's reservoir, and completed 300 feet under the lake at 1853 feet. It was drilled at a 14 degree angle with a whipstock, and its cost was estimated at about 50 percent higher than drilling in the conventional manner. Other tests will probably be drilled in the same manner. Pending a production test, last week's completion was estimated between 250 and 300 barrels daily.

Illinois production records were broken last week when McBride, Incorporated's Lee 10, Section 29-2n-2e, in the Lake Centralia-Salem pool of Marion County, flowed 7344 barrels on initial 24-hour test. This company's Lee 6, completed a few weeks ago with an initial 6000 barrels daily, is the second largest well. Production is from McClosky lime.

Northeast of St. Louis, L. A. Reed of Longview, Texas, has taken over the Jersey Oil Syndicate to drill the Grover Pearce 1, SW NE 27-8n-10w, near Jerseyville, Jersey County. The wildcat will be started by July 15, with an 1800-foot contract depth.

Ohio Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Athens County—		
G & K Oil & Gas Co., Ogg 1	3	492
Speary O&G Co., Linscott 1	¶.21	626
D. T. Orndoff, Wooley 2	¶.10	1556
Fairfield Gas Co., Walkins 5	*	1301
Nuzum et al, Judson 2	*	1630
Auglaize County—		
Ira Price, Fee 1	*	1418
Fairfield County—		
City Nat. Gas Co., Bowers 2	¶.12	2091
Gallia County—		
Addison Syndicate, Murray 1	¶.13	1443
Guernsey County—		
Ohio Fuel Gas Co., Smith 1	¶	1505
Hocking County—		
Preston Oil Co., Sunday Creek Coal Co. 1687	100	3564
Holmes County—		
Ohio F. G. Co., Johnson 2	¶.10	4057
Licking County—		
Settles Oil Co., Shannon 1	5	670
Logan County—		
Henry Vosler, Romayer 1	*	1226
Medina County—		
N. Y. O. Oil Co., Gunder 1	20	435
Meigs County—		
Ohio Fuel Gas Co., Russell 1	*	850
Muskingum County—		
Atha Oil Co., Morrison 2	5	3165
Noble County—		
Ohio F. G. Co., Ankrom 1	¶.82	1711
Perry County—		
Ohio F. G. Co., Jones 7	¶1.40	3738
Tuscarawas County—		
Status Dev. Co., Birmeler 1	¶1.65	4712
Washington County—		
Dickson et al, Johnson 2	¶	1867
Vickers Oil Co., Perdew 9	*	1336
Perdew et al, Perdew 4	*	1237

*Failures; †Junked; ¶Million cu. ft. gas.

West Virginia Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Boone County—		
Owens-Libby-Owens, Bull Creek 13	¶.40	6004
Cabel County—		
W. Va. Gas Corp., Savage 1	¶.07	3548
Calhoun County—		
Connolly, K. Garrison 1	¶2.30	2251
Gilmer County—		
Carnegie Nat. Gas Co., Rexroad 1541	¶.36	1988
McCall Dr. Co., Ellyson 1	¶.03	2283
Kanawha County—		
Spartan Gas Co., Burdette-Haston 1	¶9.85	4909
Lincoln County—		
Ward Gas Co., Ward Stowers 1	¶.30	4002
R. H. Adkins, Irene Perry 1	¶.12	2292
Mingo County—		
Kermit Gas Co., McCormick 1	¶.22	3074
Pleasants County—		
A. M. Cooper, Dawson 1	¶	1742
Ritchie County—		
Mahaney & Lucas, Smith 1	*	2035

*Failures; †Junked; ¶Mil. cu. ft. gas.

Indiana Activities

Luce Township well promises first Aux Vases oil.

Harmony Township strike in Posey County confirmed.

Evansville, Ind.—W. W. and Frank Damron's Effie Miller 1, NE NE NE 2-8s-7w, Luce Township, Spencer County, promised the first Aux Vases sand producer in southern Indiana when it cored 4 feet of commercial saturation below 1534 feet. It was being prepared for a pumping test following a shot, with some oil flowing into a pond on location. Storage tanks were being erected.

Superior Oil Company's Ribeyre Island (New Harmony Realty Company) 2, SE 9-5s-14w, Harmony Township, Posey County, drilled out plug to 28 feet of Waltersburg sand saturation, topped at 2180 feet, and started flowing into pits through ½-inch choke at the rate of 300 barrels a day. It confirms this company's pool opener of a week ago, which started at 14 barrels an hour when plugged back after finding the McClosky dry. The pay formation was topped at the same level in both tests. Derrick was up for No. 3, 900 feet north and 2310 feet east of SWc NW 10-5s-14w, which will be drilled by Loffland Brothers, contractor.

Wildcat failure of the week was Eason Oil Company and Glad Oil Company's Park Land 1, NW C SE 14-6s-11w, in the city of Evansville and 6 miles northeast of the Heusler pool of Posey County, which was abandoned at 2650 feet after finding the McClosky lime dry. The lime was topped at 2560 feet. A special act of the recent Indiana legislature was necessary before this wildcat could be started, the act giving authority to cities in Evansville's class to lease park lands for oil exploration.

In the growing Griffin pool of Gibson County, J. E. Amis et al's Amis-Cooper 1, NW NE NE 24-3s-14w, Wabash Township, had casing set to 2658 feet with the tools 230 feet lower. Drillable liners were placed opposite sand saturations, several of which were shown by an electric test to be capable of commercial production. Twenty feet of Waltersburg saturation was topped at 2080 feet, or about 40 feet higher than most tests in this pool; Cypress sand was between 2504 and 2530 feet with the lower Cypress between 2559 and 2592 feet, and Rosiclare between 2830 and 2834 feet.

In the White River Township of this county, Michel Brothers Company's Fannie G. Pytnam 1, NW NW NW 25-1s-12w, found the McClosky dry and was shut down at 2405 feet. It may be deepened. This operator's Will Carrithers 1, NE SE 26-1s-10w, was setting pipe to shut off water. Bottom was at 1325 feet.

Gulf Refining Company's Blockley (John Pfeiffer) 1, NW NW 13-6s-13w, near Buffin, Black Township, Posey County, reported 6 feet of saturation below 403 feet and was drilling ahead.

Jess Kennard has taken over Delbert Haynes 1, SE SE NE 11-6s-7w, Grass Township, near Midway, Spencer County, from J. Ervin Taylor and L. L. Lemoine. It was drilling at 100 feet at last report. Kennard had a part in drilling the Blackwell discovery well in Henderson County, Kentucky, a year ago. In this county, Damron Brothers attempt to extend the Rockport gas pool 1¼ miles failed when the Waltersburg sand failed to reveal a gas showing at the Amos Wright 1, NW NW 29-7s-6w. Kentucky Natural Gas Company spudded P. H. Axton 1, NE NE 30-7s-6w, while H. C. Hume's Joe Stewart 1, NW NW SE 28-6s-5w, near Grandview, was drilling below 1300 feet.

E. L. Newton was moving in materials for Ida Baum 1, NW SW SW 9-6s-7w, Boon Township, near New Hope, Warrick County.

Kentucky Fields

McLean County gets new oil field; Utica is extended

Owensboro, Ky.—H. H. Schwartz' Frissee-Traylor 1, 2 miles southwest of Beech Grove, McLean County, indicated a new McClosky lime pool when it cored 5 feet of saturation, described as good, below 1233 feet. The wildcat, put down with a core drilling machine, was reaming out to run casing. It had previously passed through slight oil showings in the Hardinsburg and Tar Springs.

Ohio Oil Company's S. Coomes 1, 2½ miles northwest of Utica, extended the Utica pool of Daviess County to the west last week when it was completed in the McClosky lime at 1809

Indiana Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Posey County—		
Superior Oil Co., Ribeyre Island 1	300	2400
Vanderburg County—		
Eason Oil Co. and Glad Oil Co., Park Land 1	*	2650

*Failures; †Junked; ¶Million cu. ft. gas.

Kentucky Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Butler County—		
Butler Oil Co., Ward 1	20	416
Rex-Pyramid Oil Co., Baker 1	*	500
Daviess County—		
Hart & Hard, Nantz 1	70	791
J. C. Miller, Morgan 3	50	1376
Farmer & Chenault, Nation 3	50	1350
Lincoln Pet. Co., Igleheart 3	*	1406
Henderson County—		
Springrose Dr. Co., Pillman 2	*	1986
Phillips, Jones 2	*	2110
Knott County—		
Inland Gas Corp., Amburgy 1	¶.25	3582
Muhlenberg County—		
Phillips, Boggess 2	*	1650
Ohio County—		
Ashby et al, Combs 2	*	517

*Failures; †Junked; ¶Mil. cu. ft. gas.

feet with an initial flowing production of 10 barrels an hour.

Other operations in Utica pool developed the following: C. E. Daugherty and Jim Ellis' Rex O'Flynn 1, on the northwest side of the pool, was shot simultaneously in the Jett and Jones sands for an estimated initial production between 75 and 100 barrels a day. W. E. Hupp et al's N. Akin 1 reported salt water in the McClosky after encountering a slight showing of oil at 1800 feet. Farmer & Chenault's R. F. Nation 3 was shot in the Barlow sand at 1350 feet for a 50-barrel well. Nation 2 on this lease was yielding from 50 to 70 barrels daily from the Barlow, while No. 4 was nearing the sand.

Hart & Hart's W. M. Nantz 1, near Maceo, which indicated a new Daviess County pool several weeks ago when saturation was encountered in the Jett sand, was drilling ahead last week for a test of the McClosky lime, expected at about 1350 feet. If production is not obtained in the lime, it will be plugged back for a test of the sand at 800 feet.

With several major companies holding leases in Morgan, Magoffin and Johnson Counties, along the Irvine-Paint Creek fault in eastern Kentucky, several deep wildcat tests are contemplated for the area this season. Leasing activities indicate tests may be carried to 7000 and 10,000-foot depths, which should penetrate the Cambrian age formations below the Ordovician, which includes the St. Peter. While a number of tests in eastern Kentucky have been carried to below 3000 feet, few, if any, have been carried below 5000 feet.

Magnolia wants 20-acre West Ranch spacing

Magnolia Petroleum Company has requested 20-acre spacing for wells in the new West Ranch field, Jackson County. The field is located adjacent to the town of Vanderbilt, near which one well has been producing for about two years. Whether the new area will include this old well has not been determined.

H. A. Noble, geologist for Magnolia, said that the field would include about 3700 acres, but the productive limits have not yet been defined.

There are 11 oil wells producing from the Frio at about 5000 feet. A second sand is productive some 400 feet below.

The operators reported two gas sands above the upper oil sand. The gas-oil contact on the upper field is found at —5065 feet. The oil-water contact is found at —5120 feet. The top of the oil sand in the deeper horizon is at —5482 feet. Permeability and porosity tests are indicated in the table below:

Cores: Depth	Horizontal Permeability Milli D'Arcys	Porosity Percent
—5098 to 5103	1055	28
—5103 to 5108	1038	31.44
—5108 to 5113	960	27
—5113 to 5122	1580	27.4

The Magnolia wells have been drilled in an east-west line across the center of the West Ranch and are located 1320 feet apart. Noble estimated that Magnolia owns approximately 95 percent of the productive acreage.

West Texas Fields

Wasson edge wells indicate extensions in future.

Johnson-Foster extension test gets sulphur water.

Midland.—Completions on the extreme northwest and east edges of the Wasson field, situated on the Yoakum-Gaines County line, forecast additional extensions as being possible, while the eventual linking of the area with the Bennett field has been conceded for several months. Aloco Oil Company's Johnson-Texaco 3, SW NW SE Section 772, afforded a minor northwest extension in registering a steady flow of 15 barrels of oil hourly after using 1500 gallons of acid at 5233 feet. Shell Oil Company's Roberts 7, NW SW NW Section 793, became the most westerly producer for this northwest sector in developing a yield of 10 barrels of oil hourly by heads through tubing choke following multiple acid treatments at 5240 feet.

The most easterly producing section of the Wasson structure contributed another large well when Magnolia Petroleum Company's Kendrick 2, SW NW NE Section 825, earned a potential rating of 1200 barrels after using 6500 gallons of acid in broken pay at 4980-5119 feet. Proposed east outpost tests are being deferred until Shell Pipe Line Corporation's 6-inch crude line now under construction provides relief for the unconnected wells.

Wm. Hanagan and Richmond Drilling Company's University-Stanolind 1, situated on a geophysical prospect in southwestern Andrews County, failed to encounter saturation in fulfillment of depth contract at 5005 feet. Operations have been suspended but nearby lease owners may constribute toward deepening the wildcat to the main water level.

Sloan & Zook Company and Ferndale Drilling Company's Johnson 1, previously reported as indicating a 1½-mile northwest extension for the Johnson-Foster area, Ector County, encountered sulphur water in deepening to 4365 feet. The hole will be plugged back for nitro shot in broken pay at 4087-4142 feet. It was rated at 25 barrels daily on swabbing tests before entering the water zone. Half-mile east extension for the north portion of the North Cowden field is to be sought by Tide Water Associated Oil Company and Edson Petroleum Company in starting operations on Roberts 1, SWc NE PSL Section 22, Block A. This 160-acre site was purchased last may for a bonus of $250 per acre, including $50 per acre cash.

A structure in southeastern Reeves County outlined recently by core drilling is to be tested for production in the Delaware by Forest Development

Texas Panhandle Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Carson County—		
Cities Service, Burnett 31-A	¶27	2638
Skelly, Schafer 95	†	3141
Gray County—		
Nabob O&G Co., Morse 2-B	1507	2801
Sinclair-Prairie, Reynolds 3	20	3150
Hutchinson County—		
Hobbs Oil Co., Hodges 4-B	120	3052
Mid-States Oil Corp., Whittenburg 26-A	476	2725
Phillips, Cockrell 40	530	3060
Stanolind, Haile 13-B	210	3065
Moore County—		
Shamrock O&G Corp., J. P. Hight 1	¶49.9 & 127	3462
Texoma Nat. Gas Co., Thompson 7-TH	¶43¼	3400
Potter County—		
Canadian River Gas Co., Masterson 3-B	¶37.3	2280

*Failures; †Junked; ¶Million cu. ft. gas.

West Texas Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Crane County (Gulf-McElroy)—		
Gulf, McElroy 196	1353	2900
Crockett County (Crockett)—		
Gilcrease Oil Co., University-Humble 5-13	112	1442
Ector County (Foster)—		
Stanolind, Cowden 15-A	1159	4196
Ector County (Goldsmith) —		
Gulf, Goldsmith 200	1512	4214
Goldsmith 202	96	4191
Hedberg et al, Cummins 1	66	4194
Phillips-Pure, Cowden 63	1388	4170
Ector County (Jordan)—		
Kewanee Oil Co., University 5-A	1910	3651
University 6-A	1152	3652
Skelly Oil Co.-Atlantic, University 3-E	829	3645
Ector County (North Cowden) —		
Stanolind, Roberts 15	1019	4390
Texon et al, Midland-Conoco 2-A	1153	4459
Ector County (Wildcat)—		
J. T. Barnes-Conkling & White, Thomas 1	*	4752
Gaines County (Wasson)—		
Carter et al, W. M. Moore 3	572	5060
Phillips, Wasson-Loffland 2	638	4995
Hockley County (Slaughter)—		
Richardson et al, Slaughter 1-B	1639	4975
Howard County—		
Barron & Bryan (was A. E. Walker), Davis 1	738	2793
Shasta Oil Co., Texas Land & Mtg. Co. 6	1415	2847
Howard County (Wildcat)—		
Shaw, Tr. et al, Wilkinson 1-B	*	4704
Jones County (Wildcat)—		
Lawson et al, McNair 1	*	2185
Jones County—		
Bert Fields-Carey King, Humphrey 4-B	926	3274
Gregg Oil Co. et al, Appling 2	345	2636
Omohundro et al, Street-Gumm 1	284	1884
Petroleum Producers Co., Bryany-Link 1	233	1889
Pecos County (Payton)—		
British-American O. P. Co., Payton 24	132	2093
Pecos County (Pecos Valley)—		
Samwan Oil Co., B. Young-Humble 1	*	1870
Pecos County (Tobarg)—		
Marvin-Henderson Oil Co., Tippett-Conoco 2	24	501
Pecos County (White-Baker)—		
Cardinal Oil Co., White-Baker 2-A-45	122	1719
Pecos County (Wildcat)—		
Leidecker & Kenney, Lehn-Texaco 1	10	1783
Upton County (McCamey)—		
Rife et al, Baker-Republic 8	403	2287
Shell, Baker 11	690	2195
Ward County—		
Luse & Ice, Blair 9	243	2094
Sinclair Prairie, Sealy-Magnolia 5	414	3053
Yoakum County (Bennett)—		
Shell, Hodges 3	894	5236
Yoakum County (Wasson) —		
Aloco, J. T. Herd-Texaco 1	54	5157
A. Miller-Texaco 2-B	828	5176
J. P. Nystel-Texaco 2	950	5143
W. F. Walker-Texaco 2	723	5175
Devonian Oil Co., L. K. Ory 2	1228	5128
Magnolia, Kendrick 2	1200	5119
Shell, Baumgart 2-A	889	5157
Skelly, T. R. Rhodes 1	813	5134
Wynne, Tr., Clawater-Amerada 3	974	5225

*Failures; †Junked; ¶Million cu. ft. gas.

Corporation's I. E. Hill 1, C SE H&GN Section 286, Block 13. It is 11 miles east of Balmorhea.

Crude yield from Harold Opp et al's Jackson 1, prospective wildcat producer for Schleicher County, was increased to about 75 barrels daily on swab after using 1000 gallons of acid in Pennsylvanian lime at 4049-61 feet. Prior to acidizing the test yielded 20 to 25 barrels of 34-gravity oil daily when swabbed at intervals. It will be reacidized and probably deepened.

In northern Pecos County, Tex Patillo and Sahara Oil Corporation's Gilworth 1, near west corner of H&GN Section 90, Block 10, encountered oil and gas show in lime at 1672-85 feet. The hole was loaded with water to deepen with tools. Gulf Oil Corporation retained deep mineral rights in farming out the drilling site.

Rodessa allowable fixed

The Texas Railroad Commission has entered an order effective July 1, fixing the gas allowable for the Rodessa field at 56,432,000 cubic feet daily.

West Central Texas Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Brown County—		
Eakin et al, Williams 1-A	*	1104
Hart et al, Richmond 4	*	1315
Mitcham Bros., Perry 4	10	1243
Newburn et al, Faulkner 1	*	1960
Norman et al, Page 1	*	965
Western Well Service Corp., Curry 1	*	1304
Newsome 1	*	1355
Brown County (Wildcat)—		
Goss et al, Steel 1, sec 32	*	735
Lancaster & Milton, McArthur 1, sec 33	*	1403
Callahan County—		
Dunlap et al, S. N. Dunlap 1	*	802
Henson et al, Wilson 1	*	517
Johnson et al, Hickman 1	*	467
Thomas et al, Ramsey 1	*	1328
Wittmer O&G Prop., Williams 1-B	*	945
Callahan County (Wildcat)—		
Johnson-O'Dell & Moore, George 1, sec 20	*	840
Coleman County—		
States Oil Corp. et al, Goodson 1-B	15	3645
Stockard 2	145	3629
Western Well Service Corp., Hickman 1	*	1338
Coleman County (Wildcat)—		
Mace & White, Stevens 1	*	2007
Comanche County—		
Corvette Oil Corp., Poteet 5	60	2842
DeArman et al, Moorman 1	6	2860
St. John & Choate, Smith 3	15	633
Whitesides Bros. et al, Anderson 2	4	615
Eastland County (Wildcat)—		
Choate et al, Yancey 1	*	1212
Gamblin et al, Daniels 3	†	454
Hoffman-Page Co., Hathcock 1	*	3635
Reeves et al, Weaver 1	*	1648
Trentman-Butler & Horne, Tyler 1	5	2501
McCulloch County—		
Noble & Johnson, Patton 2	¶6½	1600
Palo Pinto County—		
Lane et al, R. S. Dalton 1	7	1223
Palo Pinto O&G Corp., Rector 2	130	3081
Shackelford County (Wildcat)—		
Bissey & Smalley, Smalley 1, sec 11	*	810
Everts et al, E. S. Dawson-Conway 1, sec 175	*	1803
Kleiner & Heltzel, Morris 1-198	*	1733
Shackelford County—		
Alexander et al, Fee 1	*	725
Canyon O&G Co., R. J. Moberley 1	*	710
Crenshaw et al, Lynch 1	*	310
Danciger, McCown 4	1200	3205
Fortson et al, McCown 1	435	3192
Holder et al, Elliott 1	*	1027
Iron Mt. et al, Beck 8	185	3235
Keyes et al, Diller 1-B	*	830
Keyes & Reed, Alexander 1	*	610
Lawson Pet. Co., Lee 9	*	1056
Lee & Key, Lee 3	30	1141
Owens-Snebold Oil Corp., Haterius 3	1680	3211
McCowan 1	2000	3190
J. S. McKeever 1	1500	3199
Roeser-Pendleton-Continental, Cook 34-A	85	1292
Cook 35-A	9	1348
Cook 36-A	*	1464
Ungren-Frazier et al, McCown 3	1680	3178
Stephens County—		
Simon et al, Beck 1	*	1662

*Failures; †Junked; ¶Mil. cu. ft. gas.

North Texas Fields

Mile extension will stimulate Hull-Silk drilling.

Simpson lime assured as new pay for Walnut Bend.

Wichita Falls. — Stimulation of development in the Hull-Silk field, northeastern Archer County's most important Strawn area, will follow the completion of a mile extension that gives promise of becoming the largest producer in the county. Bert L. Ligon et al's S. D. Johnson 1, SWc of the east 240 acres of HT&B Survey A-199, advanced production due east of the northernmost well in the field with a rated flow of 120 barrels of high gravity oil hourly. The well kicked off with the aid of the swab after drilling plugs from 5 3/16-inch pipe cemented at 4300 feet, and made its favorable production without building up pressure. Production is from oil sand at 4311-48 feet. Top of lime was called at 3806 feet, or 28 feet lower structurally than the nearest producer in the same lower Strawn zone.

Production Test Due

Production test was due late last week on King Oil Company and Phillips Petroleum Company's Wilson 1, Lot 6, Section 23, prospective Caddo lime producer for the southwest portion of the Hull-Silk field. Saturation was logged in lime at 4751-55 feet several weeks ago, and the test was carried to 4821 feet before landing pipe at 4740 feet to try for a completion. Top of the Strawn lime was logged at 4005 feet. No saturation of any consequence was found in the Strawn series.

Sinclair Prairie Oil Company's Whaley 1, 3½ miles east by north of production in the Nocona deep lime pool, Montague County, was drilling in sand and shale at 4733 feet, below the projected Strawn pay level, and will continue to the Ellenberger. Sand at 4380-4420 feet probably carried water.

Discovery Offset Produces

Stanolind Oil & Gas Company's Zachary 1, west offset to the Strawn discovery of the Strawn pool at Nocona, was cleaning out after a 20-quart nitro shot in the saturated zone at 4639-61 feet. It was rated at 35 barrels daily prior to the squib shot.

Nominal oil saturation has been logged at frequent intervals by Frabor-Hodges Corporation and Sinclair Prairie Oil Company's Kinder 1, western Clay County wildcat, in drilling through the Strawn series to 5240 feet. Originally scheduled for a 5000-foot test, owners plan to continue it to the Ordovician. It is doubtful if the numerous shows passed up below 3684 feet warrant the running of casing for a production test.

Development of oil production from the Simpson lime, thereby establishing a lower pay for the Walnut Bend pool, Cooke County, was assured early last week when Sinclair Prairie Oil Company's Best 10 filled with oil. Swabbing tests failed to make a flowing producer. Top of Simpson was called at 5230 feet, and the saturated zone prevailed at 5330-81 feet. The hole was drilled to 5643 feet, then plugged back to 5565 feet to run 5½-inch pipe at 5285 feet. The company's Best 12 encountered water at 5474 feet in Simpson, topped at 5269 feet, and is plugging back to try for a completion in the Simpson.

Ivy extended 1800 feet northwest by Tal-Vez

Abilene, Texas.—Productive limits of Ivy pool, Shackelford County's most active drilling area, were extended 1800 feet northwest when the Tal-Vez Oil Company's McKeever 1, near SE NE NW Section 158, gauged 25 barrels of oil hourly natural through ¾-inch choke from Palo Pinto lime at 3146-88 feet.

Stonewall County's Palo Pinto lime development was at a standstill following completion of Forest Development Corporation and Carl King's Moreland 1, C SW SE H&TC Section 183, Block D, as a failure at 5541 feet. Top of Palo Pinto was called at 5137 feet.

North Texas Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Archer County (K-M-A)—		
Hamon, Hanlon & Buchanan, Ferguson 3, blk 14	464	3873
Archer County—		
Andrews & King, Andrews 1	*	1002
Burns et al, Prideaux 4, sec 1868	*	903
A. Schlumpf 1, sec 37	*	926
Johnson & Mitchell, C. L. Abercrombie 1	12	1302
Archer County (Wildcats)—		
Fraser et al, Coleman 1, blk 56	*	2480
Underwood Oil Co., Key 1, blk 1	*	1448
Clay County—		
Cooper et al, Duncan-Texaco 2, blk 16	46	1215
Duncan-Arnhold et al, Duncan 13 blk 17	*	1248
Sussex Oil Corp., Shumake 24, blk 4	*	437
Clay County (Wildcat)—		
Burns et al, C. L. Wynn 1, blk 34	*	5202
Cooke County—		
Staniforth et al, Voth 1-B	35	1797
Pace Pet. Corp., Winstead 9-B	72	1197
Jack County—		
Callahan & Jackson, Hoefle 5	28	422
Hoefle 6	17	425
Edmonds et al, Hunt Sisters 5	5	470
Gilmore et al, Rooney 1, sec 3320	*	480
Grace et al, Hoefle 2	27	422
Smith et al, Bloodworth 1	*	323
Montague County—		
Falls Ref. Co.-Yeargin, Bouldin 6	10	781
Montague County (Wildcat)—		
Frank et al, Cochran Bros. 1	*	2006
Montague County (Nocona)—		
Rogers & Rogers, Astley-Texaco 1	944	5489
Throckmorton County—		
Payne & Patterson, R. W. Kelly 2	19	776
Wichita County (K-M-A)—		
Bolin et al, Preston 6, sec 20	696	4024
Consolidated Oil Co., Barnes 3-A, sec 2	624	4010
Deep Rock Oil Corp., Hamilton 4	848	3850
Fain-McGaha Oil Corp., Griffin 11-B, lot 3	1584	3814
Hammon et al, McCarty 11-L	592	4010
King Oil Co.-Perkins-Cullum, Ferguson 6	720	3760
P. G. Lake, Inc., Griffin-Reilly 4	704	3984
Shell-Phillips, Preston 6-A, sec 20	524	4003
Ven-Mex Oil Co., Big Wichita River 5-A	1344	3785
Wichita County—		
Deaton & Boardman, Warren 9	*	530
Fisher & Dudley, Warren 5	336	1366
Gaut et al, E. R. Davis 1, blk 28	*	654
McClure et al, Goetze 1	5	441
Goetze 2	*	463
Mitchell Oil Co., Mitchell 3-B, lot 23	*	1363
Montgomery et al, Karrenbrock 1	5	583
Montgomery & Woodlief, F. M. Weaver 2	15	1262
Panhandle, Burnett 13, sec 6	5	1415
Proctor et al, Foster-Allen 36-A, sec 2	66	1687
Weilder et al, Birk 3	*	288
Young County—		
Clarida et al, F. C. Clarida 1	*	620
West & Stanford, Williams 3	10	564
Worthington et al, B. Schlegel 1, sec 79	*	1165
Cooper-Seibold 4, sec 81	*	1198
Zweifel et al, Vaughan 1-B	¶10	2539

*Failures; †Junked; ¶Mil. cu. ft. gas.

East Texas Fields

Large gas well completed in Travis Peak at Waskom

Marshall, Texas.—Perforating casing from 5890-5930 feet in the Travis Peak, Arkansas Fuel Oil Company completed Abney B-1, J. J. Blair Survey, in the Waskom field, Harrison County, at 5952 feet, flowing an estimated 32,000,000 cubic feet of wet gas daily. Rock pressure was 2335 pounds.

Southeast of Atlanta, the Cass County wildcat of Red Iron Drilling Company, Spearman 1, Burnham Survey, arranged to core at 3331 feet after getting a break in formation. The well found salt water in the Blossom. It is a Woodbine sand test.

In the Jefferson part of the Rodessa field, Marion County, a new producer was added last week by Cable Tool Drilling Company at Sol Smith 1, Hanks Survey, which flowed 15 barrels hourly through ¼-inch choke at 5985 feet. In the same area, Magnolia Petroleum Company's Duncan 1, Davis Survey, was swabbing after treating with acid at 6002 feet.

Forty-acre spacing asked for Mankins

Forty-acre spacing for wells in the deep Mankins Pool, Archer County, has been requested by British-American Oil Company, owner of most of the acreage in the field. The rule would apply to wells producing below 4000 feet.

The company completed its Wilson No. 1, in Section 12, Block 3, H&TC Survey, Archer County, on May 18. The new field is three miles south and one mile west of the town of Mankins.

The Caddo lime was topped at 4664 feet, and the well was drilled to 4739 feet. The lime extended to 4700 feet. The casing was perforated with 64 shots between 4660 feet and 4680 feet, and the well came in for 127 barrels.

After it was treated with acid, the well made 23 barrels per hour, settled production, with a gas-oil ratio of 1000/1. The oil is 42.46 gravity.

The company estimates that 1800 acres will be productive on this anticlinal structure.

Proration on acreage and per-well was requested, with 50 percent allocated on each factor. A maximum of 60 acres could be assigned to the final well drilled on a lease.

Because the first well was drilled within 330 feet of lease lines, the company asked that this be a minimum rule in fixing the spacing program; however, F. V. L. Patten, chief petroleum engineer for the commission, pointed out that this would result in uneven spacing and suggested that wells be located in the center of 40-acre blocks.

East Texas Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Joiner Area—		
Stanolind, Maxwell 41-A (108½-ac)	5400	3826
Kilgore Area—		
Hawkins-York & Lawley, Williams 1-a (2.54-ac)	240	3648
Kemp et al, King 7, blk 138	600	3533
Texas Co., Cole 45 (145.15-ac)	1500	3530
Trapp et al, J. R. King 6 (2.8-ac)	2400	3600
Longview Area—		
Petroleum Co., Colburn 13 (36.86-ac)	6500	3600
Stanolind, Whatley 17 (51.76-ac)	6000	3561
Anderson County (Cayuga)—		
Tide Water-Seaboard, Clay 1	¶85	4048
Franklin County (Talco)—		
Humble, Penn-Humble 7	390	4292
Freestone County (Wildcat)—		
Bunn et al, Robinson 1	*	2948
Houston County (Navarro Crossing)—		
Humble, Burns 3	104	5852
Marion County (Rodessa-Jefferson)—		
Cable Tool Drlg. Co., Smith 1, Hanks survey	325	5985
Shelby County (Joaquin)—		
Neel et al, McDaniel 1A, Wm. Snider survey	*	1510

*Failures; †Junked; ¶Mil. cu. ft. gas.

Texas permits to drill drop to 167

The Texas Railroad Commission last week approved permits for drilling 167 new wells in Texas, 32 less than were allowed the previous week.

Operators in the East Texas field were allowed 5 new locations, including 3 in Gregg and 2 in Smith County. From the remainder of the East Central Texas territory 5 locations were reported.

Gulf Coast led the state with 36 permits, while Southwest Texas operators were allowed 35 with 10 in Zapata County.

The commission approved 26 locations in West Texas and 15 in West Central Texas. North Texas producers were permitted to drill 40 new wells while Panhandle operators were allowed 5 new locations.

Robstown new Frio field in Corpus Christi area

A drill stem test was being run July 7 in Shield Oil Company's Potter 1, discovery well of Frio sand oil production on the Robstown prospect, Nueces County. The well had cored an oil sand from 5549-61 feet, and on a 5-minute drill stem test from 5540-61 feet, recovered 80 feet of high gravity oil and mud under 250 pounds working pressure through ¼-inch and ⅜-inch chokes. The hole was cored ahead to 5566 feet, reportedly still in sand, and there a second test was scheduled.

Robstown prospect has been the center of one of the hottest leasing plays in the history of South Texas wildcatting. On the basis of geophysical work by several companies, both independent and major operators entered the area with a leasing and royalty buying program. Prior to drilling the Shield well, leasing and royalty dealing accelerated to such a point that prices in excess of $100 per acre were being paid on the probable structure.

Two farmout deals were pending earlier during the past week for additional tests on this prospect, but it is believed that these will not materialize on account of the strike by Shield Oil Company.

Ten-acre spacing for White Creek

Standard 10-acre spacing for White Creek field, Live Oak County, is provided in a new railroad commission order. Operators must use 60 feet of surface casing set with 25 sacks of cement, and an oil string set with 50 sacks of cement.

Contract big condensate plant in Agua Dulce field

Clyde H. Alexander, John R. Sherrin and Robert T. Wilson have awarded a contract to Stearns-Roger Manufacturing Company whereby the latter will proceed with the construction of a 150,000,000 cubic foot condensate plant and recycling unit in the Agua Dulce field, South Texas. E. E. Debeck, of Corpus Christi, will have charge of the operation.

The contract is in connection with an operating deal recently made by Alexander and associates with Union Producing Company for some 8000 acres in the field. Under the contract, made about a month ago, it is understood that construction of the plant must be commenced within 120 days from the signing of the contract and must be in production within 6 months. The deal would further involve the drilling of at least 35 wells to sands ranging from 4700 to 6600 feet.

Union Producing Company has 35 producing distillate wells in the field in the Bentonville-Comstock and Schroeder sands. These wells have been turned to the Alexander concern. In addition 3 wells must be drilled to the Schroeder sand and 27 to the Comstock and Bentonville sands, plus 6 input wells. If more input wells are required, they are contracted to be drilled. The wells, costing approximately $1,400,000, are to be financed by the Alexander organization, but it will be reimbursed out of one half of the distillate production. Likewise, the plant, which is to cost approximately $2,000,000, is to be financed by Alexander et al. The plant will process at least 18,000,000 cubic feet per day from the Bentonville sand, 63,000,000 cubic feet from the Comstock sand and 9,000,000 cubic feet from the Schroeder sand. The recovery is expected to amount to 200 gallons per million. Union Producing Company will be permitted to take 54,000,000 cubic feet of tail gas, after it has been run through the processing unit, should it so desire. All the rest of the gas must be returned to the formation.

Under the deal, Union Producing Company has assigned complete title to the property to the Alexander firm. The taxes, royalties, etc., are to be paid out of the production, then the revenue divided equally. Union Producing Company's share is to be used to pay the cost of the drilling plus interest on the obligation for drilling.

Carter Drilling Company (Mills Bennett), of Houston, has been given the contract for the drilling of all of the wells, and is to immediately commence operations.

Agua Dulce Gas Company has made a deal with Union Producing Company for a portion of its holdings in the Agua Dulce field. Allen and Morris have been awarded the contract for 5 wells and are drilling the first. While no details are available, it is understood to be a similar deal to the one made with the Alexander group. Agua Dulce Gas Company has a condensate plant and recycling unit in the field.

Frio County failure

San Antonio.—Wilcox Oil & Gas Company scored another Edwards limestone failure in its wildcatting program southwest of San Antonio in the abandonment of R. H. Harris 1, Section 3, about 4½ miles southwest of Friotown in Frio County. The well topped the Edwards limestone at 4134 feet and was stopped at 4192 feet, showing sulphur water.

Southwest Texas Fields

Jim Wells County well spraying oil from Vicksburg-Frio. Several important wildcat operations end as failures.

Corpus Christi.—South Texas Gulf Coast was adding its newest oil field, a producing zone in the Vicksburg-Frio series in Jim Wells County. J. R. Hunter, W. R. Quinn and W. Earl Rowe's Pundt 1, on the Wade City prospect, four miles northwest of Orange Grove, was flowing considerable gas with a spray of oil through ⅛-inch choke and showing 1625 pounds tubing and 1600 pounds casing pressures. Perforations had been made 4794-98 feet.

The well, if a gasser, will be reworked in an effort to induce oil flow. The bottom of the perforations are considered to be 22 feet above the base of the sand.

In the same county, several wells are drilling near the discovery sand of the Reynolds field, their outcomes having an important bearing on the future of this new area. North of the Ben Bolt new discovery, however, much discouragement was recorded in Pettus Oil & Refining Company's Garcia 1, Block 15, finding salt water sand at 5429-80 feet and being shut down below 6000 feet. H. H. Howell's Lindsay and Reed 1-A, Lot 21, found sand at 5408-94 feet and was abandoned at 5750 feet. Another abandonment for the county was R. A. Irwin's Garcia 2, southeast of the Magnolia City field, which quit at 5913 feet.

In Nueces County, Texas Conservative Oil Company's Humble 1 flowed salt water and oil from perforations at 5658-63 feet and had squeezed preparatory to reperforating in the same zone. The well, one mile northeast of the Minnie Bock field, was low on the discovery pay and was drilled ahead.

Shield Oil Company's Potter 1, northwest of Robstown and on the highly touted Robstown prospect in Nueces County, found salt water sands and was going ahead below 5515 feet.

Drilling ahead to 6015 feet, Seaboard Oil Corporation of Delaware was awaiting orders in Blumberg 1, 9500 feet northeast of the discovery of the East Mathis field of San Patricio County. Casing may be set for production tests.

Several important Refugio County wildcats were abandoned. Hewit and Dougherty's B. D. Rooke 2-A, 1 mile southwest of the LaRosa field, was stopped at 6505 feet. Phillips Drilling Company's Hunsdon 1, four miles east of the field, was abandoned at 7020 feet. Phillips Petroleum Company's Toland 1, more than one mile east and north of this field, was going ahead below 5500 feet.

Quintana Petroleum Corporation et al's Williams 12-A provided a southeast extension to the Tomoconnor production. The well, located 3327 feet southeast of No. 3, flowed 563.68 barrels of oil per day through ¼-inch choke from perforations at 5914-18 feet. It showed 910 pounds working pressure.

Potential test on Magnolia Petroleum Company's West 12-A, westernmost well in the West Ranch field of Jackson County, rated the well at 115.22 barrels of pipe line oil per day through 9/64-inch choke under pressures of 500 pounds on tubing and 800 pounds on casing. Gas/oil ratio was 498 cubic feet to 1 barrel. The well, completed at 5544 feet, extended the main field ¼ mile west and at the same time widened the 5500-foot sand two miles to the south.

Mayo, Frost and Cullen et al's Tucker 1, 1½ miles northwest of the Vanderbilt townsite and on the same general structure, found a sand below 5000 feet corresponding to the west pay but drilled to 5820 feet. The hole was found to be crooked and was plugged back to redrill the section. The 5000-foot pay will be recorded.

British American Oil Company and Wynn Crosby's Hale & Alee 1, 4500 feet northeast of production in the Francitas field, also Jackson County, is shut down at 8036 feet, failing to find production in the 8000-foot sand. Upper sands showed either gas or salt water and distillate.

White Creek well completing after blowout

Beeville.—Coquat et al's Bonham 2, north offset to the westernmost well in the White Creek field of Live Oak County, blew out at 1440 feet and ran wild several hours before being controlled. Casing was set and the well was being completed through perforations at 1386½-97½ feet. This well places the field in the position of being an important producing area. Two other wells to the south and southeast of this well ranged from 200 to 400 barrels per day, flowing by heads. The discovery and several tests drilled immediately after it had been completed made small producers or failed to find the sand commercially productive.

Rincon extension try to northeast is failure

Mission.—Efforts to extend the Rincon field's production in Starr County to the northeast failed when Vessel & Baldridge's Cameron 1, Section 228, made oil and salt water at 4230-39 feet. The hole was halted at 4302 feet, but may be carried deeper.

The above field has several distillate wells and one crude producer in the Frio-Vicksburg zone. The new well was looked upon as being a probable extension, but it logged the sands unusually low.

In Brooks County, a second producer for the Kelsey field was considered posssib'e as Humble Oil & Refining Company cored for the 6000-foot pay in McGill 15.

About one mile northeast of the Sam-

South Texas Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
SAN ANTONIO DISTRICT		
Bexar County—		
Edwill, Ritter 1 (WC), Jose M. Barrera sur	*	865
Caldwell County—		
Texamerica, Davis 6-C (Salt Flats)	125	2712
Medina County—		
Wagener, Medina Irrigated Farms A-38 (Chicon Lake)	*	375
CORPUS CHRISTI DISTRICT		
Aransas County—		
Manahan, Carlock 2 (McCampbell)	1050	7219
Brooks County—		
Humble, McGill 16 (Kelsey)	450	4741
Calhoun County—		
Sinclair-Prairie, Bennett 19 (Heyser)	700	5590
Cameron County—		
Sal Vieja, Newberry 1 (WC), San Martin gr	*	7585
Colorado County—		
Williams & Barnes, Tait 1 (WC), Altair area	*	3318
Goliad County—		
DeArman & Winward Oil, Drier 3 (Maetze)	*	5885
Hidalgo County—		
Phillips, Flores 3 (WC), Samfordyce area	¶2 & 46	4508
Jackson County—		
Crown Central, Foust 4 (Cordelle)	425	2671
Magnolia, West A-12 (West Ranch)	500	5514
Porter, Drushel 1-B (Cordelle)	650	2691
Jim Wells County—		
Bridwell, Beasley 1 (Ben Bolt)	550	5260
Howeth, Lewis Production, Adams 2 (West Alfred)	350	4682
Rutherford & Royal Oil, Zappe 1 (East Alice)	¶2	5343
Texas Gulf, Miller 1-A (WC), Reynolds area	¶3 & 50	5617
Kenedy County—		
Humble, Kenedy 3 (WC), X. Salinas sur	*	7706
Live Oak County—		
Luling, Great Southern 1 (WC), Farm tr 2987, blk 57	*	2065
Nueces County—		
Humble, State 2-C (Flour Bluff)	550	6647
Seaboard, La Prelle 3-A (North Luby)	*	4404
Sun, Butts 3 (Luby)	400	4345
Texas Conservative, Bock 1 (Minnie Bock)	450	3840
Western Gulf, Priour A-3 (Saxet)	130	6612
Wellington, Richardson 2 (Clara Driscoll)	550	6965
Refugio County—		
Benson & Jones, Rooke A-3 (La Rosa)	500	5889
Coronado, Rooke 22 (La Rosa)	500	5913
Coronado, Rooke 13 (La Rosa)	500	5913
Humble, Thompson 3 (WC), Cranell prospect	*	6503
Quintana, Williams 12-A (WC), Tomoconnor area	1250	5923
Williams 1-B (Tomoconnor)	1250	5925
San Patricio County—		
Abbott & Traxler, Harris 1 (McCampbell)	900	7150
Graham, Moore 6 (McCampbell)	1100	7175
Grote & Corgey, Pease 1 (McCampbell)	1000	7140
Plymouth, Heflebower 2 (E. White Point)	550	5670
Solar & Ficke 4 (E. White Point)	500	5677
Willacy County—		
Midwest, Dayton 1 (WC), San Juan de Carricitos gr	*	9005
LAREDO DISTRICT		
Duval County—		
Argo, Fee-Rodden 6 (Hoffman)	232	2832
Clark & Cowden, Peters 2-B (Rancho Solo)	Lcn.	Abnd.
Longhorn, Miller 6 (Longhorn)	550	4909
Magnolia, Duval County 12 (189) (Cedro Hill)	*	2530
Duval County 29 (201) (Eagle Hill)	60	2172
Weil 38 (Hoffman)	20	2784
Miller & Sons, Miller 10 (Longhorn)	600	4065
Navarro, Mew 3 (Fitzsimmons)	400	4264
Transwestern, Duval County 25 (297) (SRC)	79	1036
Duval County 23 (297) (SRC)	108	1041
Wheelock, Serna 1 (WC), Fitzsimmons area	*	4808
McMullen County—		
Gohlke, Miles 1 (WC), Miles Ranch	*	1197
Webb County—		
Rowan & Hope, Laurel 1 (WC)	*	4010
Schimmel, Walker 1 (WC)	*	1723
Zapata County—		
Buffalo, Hinnant 14-C (Mirando Valley)	108	1990
Carter & Rubsamen, Lopez 4-A (South Mirando Valley)	*	1863
Lopena, Raminez 1 (Lopena)	Lcn.	Abnd.
Nash & McKay, Garza 17 (Escobas)	*	1248

*Failures; †Junked; ¶Mil. cu. ft. gas.

fordyce field in Hidalgo County, Smith and Wheelock & Collins' Yturria 1 made salt water and gas through perforations at 3482-92 feet and was testing higher in the zone.

Pantano Oil Company's community block deal in the La Blanca field of Hidalgo County was reported to be near completion. The company plans several tests and will construct a recycling plant.

After making a large volume of salt water, Sal Vieja Oil Corporation has abandoned Gatewood Newberry 1, 13 miles east of Brownsville in Cameron County, at 7585 feet.

New Webb County area apparently is defined

Laredo.—Volpe field, new producing area in Webb County, apparently was defined one mile to the south by Houser and Campbell's A. B. Longoria 1, Section 692. The well found Mirando oil sand at 2482-90 feet, but the show was considered too slight to produce. It was drilling deeper.

V. G. Schimmel's Benavides 1, Section 693, two miles southwest of the Volpe field and between crude production in the two oil sectors of the West Cole field, was testing at 2350 feet. The well cored sand with gas odor at 2336-41 feet and oil sand at 2341-50 feet. It is considered to be linking production in the West Cole area rather than an extension to the Volpe.

William M. Nicholls et al's Graham 1, discovery of the Chiltipin field of Duval County, is classified as a completion. It flowed gas with spray of oil from perforations at 4784-90 feet, where 24 shots had been made. The flow was through ⅛-inch choke with pressures 1440 pounds on tubing and 1660 pounds on casing. The test will furnish gas for other operations in the area and later will be reworked.

Texas Gulf Coast

Martha wildcat makes 10 barrels light oil hourly. Esperson has new sand; Cheek extended southeast.

Houston.—Martha prospect, Liberty County, was converted into an oil field last week when Stanolind Oil & Gas Company completed Flowers 1, I. & G. N. Section 7, flowing 10 barrels of 39-gravity oil per hour through a 5/32-inch choke from Frio sands perforated with 12 shots from 8104 to 8108 feet. Tubing pressure was 1200 pounds and casing pressure was 1500 pounds. No salt water was reported. The test was drilled to 9109 feet and 5½-inch casing was set at 8749 feet. The first test at 8104 feet showed oil and salt water. Perforations were squeezed with cement and new perforations made. Martha makes the fourth field discovered in the Texas Gulf Coast this year.

A deeper producing horizon was discovered on the flank of Esperson, Liberty County, by General Crude Oil Company's Fee 3-B, which was drilled to 7694 feet and perforated with 48 shots from 7595 to 7612 feet. It came in flowing 32 barrels of 39.1-gravity oil per hour through a ¼-inch choke. Tubing pressure was 1200 pounds; casing pressure, 1250 pounds. This is one of the best wells completed on the flank of the dome.

3500-Foot Extension

Cheek field, Jefferson County, was extended 3500 feet southeast last week when Humble Oil & Refining Company completed Steinhagen 1, W. Carr Survey, in Frio sands at 7780 feet after casing was perforated with 10 shots from 7775 to 7780 feet. The well came in flowing 168 barrels of 37-gravity oil daily through a ⅛-inch choke with a tubing pressure of 1200 pounds.

Sun Oil Company has 2 important tests in Matagorda County, which are attracting considerable attention. On the Collegeport prospect, D. Yeamans Survey, the company made a test on Savage 1 after casing was perforated with 24 shots from 2940 to 2945 feet. The 25-minute drill-stem test showed dry gas and salty mud through ¼-inch chokes. Working pressure was 325 pounds. In Buttermilk Slough area, the company reworked Cavalin 1, perforating casing with 16 shots from 7850 to 7860 feet when the swab was run. The wildcat showed 15 percent oil and the balance mud and wash water. Swabbing continued.

Needville prospect, Ft. Bend County, is becoming more attractive each day with Woodland Oil Company's Berg 1, H & T. C. No. 25, continuing to gas sands. Last week a sand was cored at 7091 to 7099 feet. The hole, bottomed at 7410 feet, is giving the operators considerable trouble. Cement retainer was set at 7325 feet.

Glenn H. McCarthy's Houston Farms Development Company 1 in the Chocolate Bayou area, Brazoria County, drilling in shale below 9300 feet, is rumored to have logged a promising sand below 8500 feet.

Northwest of Sandy Point, Brazoria County, Hamman Exploration Company's Darrington State Prison Farms 1, A. McFarland Survey, was drilling below 8900 feet at the end of the week after logging another gas sand up the hole. This wildcat indicated it would open a new producing area when a test at 8200 feet showed oil and water.

Clear Lake Extended

Clear Lake field, Harris County, was extended 2000 feet southwest last week when Humble Oil & Refining Company completed Humble-West Fee C-9 in Frio sands at 5910 feet for 84 barrels of pipe line oil daily through a ⅛-inch choke. Top of the sand was found at 5649 feet.

Humble abandoned 2 wells at Friendswood field, Harris County, one on the north and the other on the northeast side of the field. Humble-West Fee B-33 was abandoned at 6900 feet and Humble-West Fee B-35 was plugged at 6700 feet.

Texas Gulf Producing Company's Hairgrove 1, southwest of production at Aldine, Harris County, was abandoned last week at 7625 feet after being worked over. Some time ago the well was abandoned below 7000 feet, but when Earl Hankamer's Rowland 1 cored a deep sand, the company decided to carry Hairgrove 1 deeper. The well failed to find the gas and distillate sand found in Rowland 1.

On the northwest side of League City field, Phillips Petroleum Company was completing Stewart Title 2. The well was flowing 75 percent oil and 25 percent wash water through a 3/32-inch choke with a tubing pressure of 600 pounds and a casing pressure of 1300 pounds. Casing was perforated with 15 shots at 8699 to 8704 feet.

J. W. Frazier's Bergman 1 in the Goodrich area, A. Viesca Survey, Polk County, recovered salt water in the upper horizons last week and was drilling ahead to the Wilcox formation. Salt water sands were cored at 4080 to 4099 feet, 5100 to 5115 feet and from 5251 to 5267 feet.

On the north flank of South Houston field, Harris County, Commerce Oil Company's Staiti 1 attempted to blow out last week when a new gas sand was logged at 7550 feet. The operators have been having considerable trouble with heaving shale just above the sand.

Texas Gulf Coast Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Aldine—		
Texas Gulf Prod. Co., Hairgrove 1	*	7695
Anahuac—		
Humble, Johnson 28	684	7124
Cheek—		
Humble, Steinhagen 1	167	7780
Clear Lake—		
Humble, Humble-West Fee C-9	84	5910
Danbury—		
Mangawin Prod. Co., Blakley-Winston 2	*	2774
Dickinson—		
Mar-Tex, M. Stewart 12	525	8553
Pure, Kohfeldt 1	84	8505
Esperson—		
General Crude, Fee 3-B	768	7612
Eureka—		
Means & McGehee, L. Lackner F-1	114	7745
Fairbanks—		
Amerada-Stanolind, Foley 7	163	6848
Friendswood—		
Humble, West Fee-Humble 7	563	6044
West Fee-Humble B-33	*	6900
West Fee-Humble B-35	*	6700
Hankamer—		
Hatton Oil Co., Crow & Jacobs 1	600	5104
Hastings—		
Stanolind, McDonald 5	608	6080
Hull—		
Guinn Crude Oil Co., Abel A-14	10	760
League City—		
Phillips, Lobit 4	231	9200
Segno—		
Gulf, Wing 17	622	8069
Wing 19	688	8156
Silsbee—		
Humble, Theus 2	493	6945
Tomball—		
Shell, Rudel 5	505	5568
Withers—		
Texas Co., Pierce Estate B-33	64	5540
Jefferson County—		
Geo. Echols, Hebert & Smith, Fontenot 1, South China area, H. & T. B. No. 107	202	7885

*Failures; †Junked; ¶Million cu. ft. gas.

South Louisiana

Gas-distillate sand logged at Lafourche Crossing.

Eola extended northwest by well high on structure.

Lake Charles. — Mikton Oil Company's Martinez 2 at Lafourche Crossing prospect, Lafourche Parish, logged 30 feet of gas and distillate sand at 8655 to 8685 feet and was down to 8990 feet in shale at the end of the week. The hole will probably be carried below 9000 feet before protection casing is set.

Lafourche Crossing is a geophysical prospect worked by torsion balance and reflection seismograph. The prospect has shown gas seepage and paraffin dirt. Some shot holes drilled in shooting the area tried to blow out. The geophysical picture showed a big complex structure with no closure on the northeast. Some closure has been shown with the drilling of Martinez 2. The operators drilled Martinez 1 some time ago and it was abandoned below 1500 feet when it attempted to blow out around 1400 feet. Martinez 2 showed a kick on an electrical log around 8500 feet. The well probably will be drilled to 10,000 feet or deeper.

Salty on Two Tests

Atlantic Refining Company's Rice Land 1, Merryville prospect, Beauregard Parish, showed salt water 2 times last week on drill-stem tests. The hole has been plugged back and a test will be made of 20 feet of Sparta sand at 7584 feet. Last week a drill-stem test made at 8282 to 8297 feet recovered salt water and perforations were squeezed. The casing was then perforated with 24 shots at 8240 to 8250 feet. An hour drill-stem test with a 4000-foot water cushion recovered 44 stands of salt water.

On the Reddel prospect in Evangeline Parish, Continental Oil Company has plugged back Manuel 1 from 11,341 feet to 10,175 feet where it is waiting on cement to set. Continental will probably perforate casing around 9700 feet, where a "kick" was shown on an electrical log.

Eola field, Avoyelles Parish, was extended northwest by Sid Richardson's Pierce 1. The well came in flowing 271 barrels daily through a ⅛-inch choke with a tubing pressure of 1800 pounds and a casing pressure of 1650 pounds. Casing was perforated in Wilcox sands at 8412 to 8528 feet; 5½-inch casing was set at 8544 feet. This well was the highest on structure until Amerada Petroleum Corporation's Irion 1, between the Pierce 1 and the main part of the producing field, logged top of the Wilcox at 8335 feet. Pierce 1 topped the formation at 8406 feet. Irion 1 was down to 8535 feet last week and coring ahead, after logging a large body of oil sand.

North of production at Bancroft, Beauregard Parish, Republic Production Company is testing new sands in Lutcher Moore 7. Last week the well was perforated with 10 shots at 7898 to 7899 feet and a 2-hour drill-stem test through ¼-inch chokes showed 1350 feet of oil and 270 feet of salt water and mud. Cement retainer was set at 7635 feet. Casing was perforated with 80 shots at 7639 to 7641 feet and a 27-minute drill-stem test showed oil and salt water. Another cement retainer was set at 7625 feet, where the well was shut down waiting on cement to set. The same operators tested a new sand in Lutcher Moore 8. A drill-stem test at 7180 to 7200 feet showed a 675-pound pressure and 30 feet of distillate in 10 minutes through ¼-inch chokes. The regular producing sand at Bancroft is around 7350 feet.

Trying Again at China

At the China prospect, Jefferson Davis Parish, Union Sulphur Company is making another drill-stem test on Tietje 1. Last week the company perforated casing at 7582 to 7596 feet and a drill-stem test showed salt water. Cement retainer was set and casing was again perforated with 30 shots at 7549 to 7557 feet to make a drill-stem test.

Continental Oil Company is drilling another Wilcox test at Ville Platte, Evangeline Parish. Durouen 2 was drilling in shale at 9800 feet at the end of the week. It failed to pick up the Tate producing sands. Continental Oil Company has drilled 3 other wells at Villa Platte to the formation. One was a producer, the second was a dry hole, and the third was plugged back from Wilcox and completed in an upper sand.

About 1500 feet northwest of the discovery well at Kennilworth, St. Bernard Parish, Vendome Petroleum Company's Kennilworth 2 was drilling in shale at 10,915 feet and is about 300 feet below the producing sand found in the discovery well.

A new oil sand was discovered at Quarantine Bay field, Plaquemines Parish, when Gulf Oil Corporation's State 2-QQ came in flowing 238 barrels of 35.1-gravity oil daily through a 7/32-inch choke with a tubing pressure of 2700 pounds and a casing pressure of 1000 pounds after casing had been perforated with 36 holes from 8545 to 8552 feet.

South Louisiana Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Abbeville—		
Continental, Bauduin 1	*	8223
Baton Rouge—		
Guaranty Oil Co., Morgan 1	*	6511
William Helis, Materniste 1	377	6467
Lisbon-Iberia Oil Co., Duplantier 2	240	6500
Black Bayou—		
Erath Oil Co., Moore 1 (wo)	*	7180
Chalkley—		
Humble, Hanszen 4	292	8670
Darrow—		
Humble, Landry 5	*	7118
Eola—		
Sid Richardson, Pierce 1	271	8528
Grand Bay—		
Gulf, Grand Prairie Levee District 4-A	770	9700
Lafitte—		
Texas Co., School Board 2	1192	9900
Quarantine Bay—		
Gulf, State QQ 10	238	8552
Cameron Parish—		
Union Sulphur, Drew Manuel Training School, South Edgerly prospect	*	8482
St. Mary Parish—		
Acadia Prod. Co., Robchaux 1, Charenton area, 27-13s-9e	*	3110

*Failures; †Junked; ¶Million cu. ft. gas.

North Louisiana Fields

Bear Creek gas-distillate production extended a mile.

Tensas Parish test quits in salt on new-found dome.

Shreveport.—The eastern limit of the Bear Creek field, Bienville Parish, was extended one mile with the completion of a gas-distillate producer at Hunt Oil Company's Loe 1, NE NE 2-16-6. The well was completed flowing estimated 4,200,000 cubic feet of wet gas daily through ½-inch choke from 6678 feet in the Pettitt zone of the basal Glen Rose. It is the fourth gas-distillate producer for the field.

The well made 160 barrels of distillate in 24 hours through ½-inch choke. Tubing pressure was 1650 pounds and casing pressure 1750 pounds.

Union Producing Company's Walker 1, Section 30-18-8, two mile northeast outpost in the Sibley field, Webster Parish, was plugging back to make a third test in the basal Glen Rose section after two previous drill-stem tests this week showed only small amounts of gas. Casing was perforated for the first test from 5830-60 feet and the second from 5695-5760 feet. Old total depth is 10,383 feet in the Lower Marine.

Continental Oil Company's Cammack 1, Section 31-13n-12e, Tensas Parish wildcat which discovered a new interior salt dome in Northeast Louisiana, has been abandoned at 4172 feet in salt topped at 4134 feet. Another operation

North Lousiana Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Bienville Parish (Bear Creek)—		
Hunt Oil Co., Loe 1, 2 16n-6w	¶4¼	6678
Tensas Parish (Wildcat)—		
Continental, Cammack 1, 31-13n-12e	*	4172

*Failures; †Junked; ¶Million cu. ft. gas.

fordyce field in Hidalgo County, Smith and Wheelock & Collins' Yturria 1 made salt water and gas through perforations at 3482-92 feet and was testing higher in the zone.

Pantano Oil Company's community block deal in the La Blanca field of Hidalgo County was reported to be near completion. The company plans several tests and will construct a recycling plant.

After making a large volume of salt water, Sal Vieja Oil Corporation has abandoned Gatewood Newberry 1, 13 miles east of Brownsville in Cameron County, at 7585 feet.

New Webb County area apparently is defined

Laredo.—Volpe field, new producing area in Webb County, apparently was defined one mile to the south by Houser and Campbell's A. B. Longoria 1, Section 692. The well found Mirando oil sand at 2482-90 feet, but the show was considered too slight to produce. It was drilling deeper.

V. G. Schimmel's Benavides 1, Section 693, two miles southwest of the Volpe field and between crude production in the two oil sectors of the West Cole field, was testing at 2350 feet. The well cored sand with gas odor at 2336-41 feet and oil sand at 2341-50 feet. It is considered to be linking production in the West Cole area rather than an extension to the Volpe.

William M. Nicholls et al's Graham 1, discovery of the Chiltipin field of Duval County, is classified as a completion. It flowed gas with spray of oil from perforations at 4784-90 feet, where 24 shots had been made. The flow was through ⅛-inch choke with pressures 1440 pounds on tubing and 1660 pounds on casing. The test will furnish gas for other operations in the area and later will be reworked.

Texas Gulf Coast

Martha wildcat makes 10 barrels light oil hourly. Esperson has new sand; Cheek extended southeast.

Houston.—Martha prospect, Liberty County, was converted into an oil field last week when Stanolind Oil & Gas Company completed Flowers 1, I. & G. N. Section 7, flowing 10 barrels of 39-gravity oil per hour through a 5/32-inch choke from Frio sands perforated with 12 shots from 8104 to 8108 feet. Tubing pressure was 1200 pounds and casing pressure was 1500 pounds. No salt water was reported. The test was drilled to 9109 feet and 5½-inch casing was set at 8749 feet. The first test at 8104 feet showed oil and salt water. Perforations were squeezed with cement and new perforations made. Martha makes the fourth field discovered in the Texas Gulf Coast this year.

A deeper producing horizon was discovered on the flank of Esperson, Liberty County, by General Crude Oil Company's Fee 3-B, which was drilled to 7694 feet and perforated with 48 shots from 7595 to 7612 feet. It came in flowing 32 barrels of 39.1-gravity oil per hour through a ¼-inch choke. Tubing pressure was 1200 pounds; casing pressure, 1250 pounds. This is one of the best wells completed on the flank of the dome.

3500-Foot Extension

Cheek field, Jefferson County, was extended 3500 feet southeast last week when Humble Oil & Refining Company completed Steinhagen 1, W. Carr Survey, in Frio sands at 7780 feet after casing was perforated with 10 shots from 7775 to 7780 feet. The well came in flowing 168 barrels of 37-gravity oil daily through a ⅛-inch choke with a tubing pressure of 1200 pounds.

Sun Oil Company has 2 important tests in Matagorda County, which are attracting considerable attention. On the Collegeport prospect, D. Yeamans Survey, the company made a test on Savage 1 after casing was perforated with 24 shots from 2940 to 2945 feet. The 25-minute drill-stem test showed dry gas and salty mud through ¼-inch chokes. Working pressure was 325 pounds. In Buttermilk Slough area, the company reworked Cavalin 1, perforating casing with 16 shots from 7850 to 7860 feet when the swab was run. The wildcat showed 15 percent oil and the balance mud and wash water. Swabbing continued.

Needville prospect, Ft. Bend County, is becoming more attractive each day with Woodland Oil Company's Berg 1, H & T. C. No. 25, continuing to gas sands. Last week a sand was cored at 7091 to 7099 feet. The hole, bottomed at 7410 feet, is giving the operators considerable trouble. Cement retainer was set at 7325 feet.

Glenn H. McCarthy's Houston Farms Development Company 1 in the Chocolate Bayou area, Brazoria County, drilling in shale below 9300 feet, is rumored to have logged a promising sand below 8500 feet.

Northwest of Sandy Point, Brazoria County, Hamman Exploration Company's Darrington State Prison Farms 1, A. McFarland Survey, was drilling below 8900 feet at the end of the week after logging another gas sand up the hole. This wildcat indicated it would open a new producing area when a test at 8200 feet showed oil and water.

Clear Lake Extended

Clear Lake field, Harris County, was extended 2000 feet southwest last week when Humble Oil & Refining Company completed Humble-West Fee C-9 in Frio sands at 5910 feet for 84 barrels of pipe line oil daily through a ⅛-inch choke. Top of the sand was found at 5649 feet.

Humble abandoned 2 wells at Friendswood field, Harris County, one on the north and the other on the northeast side of the field. Humble-West Fee B-33 was abandoned at 6900 feet and Humble-West Fee B-35 was plugged at 6700 feet.

Texas Gulf Producing Company's Hairgrove 1, southwest of production at Aldine, Harris County, was abandoned last week at 7625 feet after being worked over. Some time ago the well was abandoned below 7000 feet, but when Earl Hankamer's Rowland 1 cored a deep sand, the company decided to carry Hairgrove 1 deeper. The well failed to find the gas and distillate sand found in Rowland 1.

On the northwest side of League City field, Phillips Petroleum Company was completing Stewart Title 2. The well was flowing 75 percent oil and 25 percent wash water through a 3/32-inch choke with a tubing pressure of 600 pounds and a casing pressure of 1300 pounds. Casing was perforated with 15 shots at 8699 to 8704 feet.

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Means & McGehee, L. Lackner F-1	114	7745
Fairbanks—		
Amerada-Stanolind, Foley 7	163	6848
Friendswood—		
Humble, West Fee-Humble 7	563	6044
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Jefferson County—		
Geo. Echols, Hebert & Smith, Fontenot 1, South China area, H. & T. B. No. 107	202	7885

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Gas-distillate sand logged at Lafourche Crossing.

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South Louisiana Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
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Baton Rouge—		
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Black Bayou—		
Erath Oil Co., Moore 1 (wo)	*	7180
Chalkley—		
Humble, Hanszen 4	292	8670
Darrow—		
Humble, Landry 5	*	7118
Eola—		
Sid Richardson, Pierce 1	271	8528
Grand Bay—		
Gulf, Grand Prairie Levee District 4-A	770	9700
Lafitte—		
Texas Co., School Board 2	1192	9900
Quarantine Bay—		
Gulf, State QQ 10	238	8552
Cameron Parish—		
Union Sulphur, Drew Manuel Training School, South Edgerly prospect	*	8482
St. Mary Parish—		
Acadia Prod. Co., Robchaux 1, Charenton area, 27-13s-9e	*	3110

*Failures; †Junked; ¶Million cu. ft. gas.

North Louisiana Fields

Bear Creek gas-distillate production extended a mile.

Tensas Parish test quits in salt on new-found dome.

Shreveport.—The eastern limit of the Bear Creek field, Bienville Parish, was extended one mile with the completion of a gas-distillate producer at Hunt Oil Company's Loe 1, NE NE 2-16-6. The well was completed flowing estimated 4,200,000 cubic feet of wet gas daily through ½-inch choke from 6678 feet in the Pettitt zone of the basal Glen Rose. It is the fourth gas-distillate producer for the field.

The well made 160 barrels of distillate in 24 hours through ½-inch choke. Tubing pressure was 1650 pounds and casing pressure 1750 pounds.

Union Producing Company's Walker 1, Section 30-18-8, two mile northeast outpost in the Sibley field, Webster Parish, was plugging back to make a third test in the basal Glen Rose section after two previous drill-stem tests this week showed only small amounts of gas. Casing was perforated for the first test from 5830-60 feet and the second from 5695-5760 feet. Old total depth is 10,383 feet in the Lower Marine.

Continental Oil Company's Cammack 1, Section 31-13n-12e, Tensas Parish wildcat which discovered a new interior salt dome in Northeast Louisiana, has been abandoned at 4172 feet in salt topped at 4134 feet. Another operation

North Lousiana Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Bienville Parish (Bear Creek)—		
Hunt Oil Co., Loe 1, 2 16n-6w	¶4¼	6678
Tensas Parish (Wildcat)—		
Continental, Cammack 1, 31-13n-12e	*	4172

*Failures; †Junked; ¶Million cu. ft. gas.

in the area is expected to be announced soon.

Arkansas Fuel Oil Company's Gayoso 1, Section 14-16-10, Lower Marine test in the Bistineau area, Bienville Parish, drilled ahead below 8491 feet in hard sand and shale without show. The company made a location to the wet basal Glen Rose gas zone at Long Bell 1, Section 14-16-10.

The Shreveport "back-yard" field, Caddo Parish, went without a completion during the week. The deepest of seven active locations in the area was C. H. Lyons' Agurs 1, Section 34-18-14, which was below 5415 feet. Two new locations were staked in the area.

Stanolind Oil & Gas Company's Dillon 131, Section 14-21-15, Lower Marine test in the Pine Island field, Caddo Parish, drilled below 4447 feet in red shale after setting 10¾-inch casing at 4020 feet. H. M. Harrell et al's Thompson 1, Section 20-12-11, mile southeast outpost in the Sligo field, Bossier Parish, was below 4583 feet.

In the Cotton Valley field, Webster Parish, Hunt Oil Company's Stewart 1, Section 32-21-10, was perforating casing in the "D" zone in which cores showed oil, after going to the Davis sand and setting 7-inch casing on bottom at 8823 feet. Hunt Oil Company and Magnolia Petroleum Company's Gray-Cox 1, Section 19-21-9, an east edge well, has set 7-inch at 8410 feet. Ohio Oil Company's Bodcaw 6, Section 13-21-10, was bottomed at 5855 feet testing the Holloway zone logged from 5773-79 feet.

In the Sugar Creek field, Claiborne Parish, Union Producing Company started a new operation at Durrett 3, 505 feet north and 323 feet east of the center of Section 5-19-5, setting 10¾-inch casing at 653 feet.

On the northwest edge of the Monroe gas field, Union Parish, We Hope Oil & Gas Company, a recently organized company headed by James A. Noe, has made locations for 2 of the proposed 15 operations on a spread of 1200 acres leased from the Frost Lumber Industries. They are Frost 2, 660 feet north and west of SEc 25-22-3e and Frost 3, 1980 feet south and west of NEc 35-22-3e.

Louisiana permits

Shreveport. — Thirty-three drilling permits were issued last week by the Louisiana Conservation Commission, of which 8 were in North Louisiana and divided among the following parishes: Bossier 1, Caddo 3, Claiborne 1, DeSoto 1, Sabine 1, and Ouachita 1. The 15 permits in South Louisiana were in the following parishes: Acadia 4, Avoyelles 2, East Baton Rouge 2, Cameron 1, Jefferson Davis 1, Iberia 1, St. Mary 3, and Terrebonne 1.

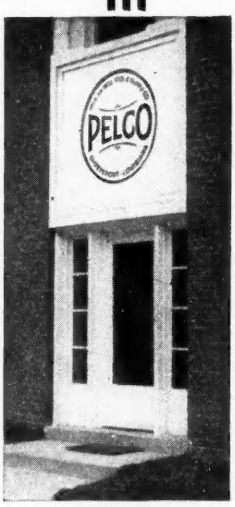
Arkansas Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Columbia County (Magnolia)—		
Placid Oil Co., Couch 1, 19-17s-19w	750	7575
G. H. Vaughn, Paschal 1, 22-17s-20w	700	7520
Shell, Peoples Bank 1, 24-17s-20w	825	7614
Union County (Schuler)—		
Lion, John 1, section 12-18s-18w..	580	7590
Clay 3, section 12-18s-18w	625	7635
Union County (Rainbow City)—		
J. R. Lockhart, Jerry 1, 15-17s-14w	530	2617

*Failures; †Junked; ¶Mil. cu. ft. gas.

What is a Producer?

A producer is a chap who wishes crude oil brought the price it did thirty years ago. Even then we were taking production equipment seriously. And we have ever since. The importance of this position is more obvious now. To the customer it often means the difference between profit and loss in operating a lease.



PELICAN WELL TOOL & SUPPLY CO.

SHREVEPORT LOUISIANA

PELCO

Lake Charles—Houma—Converse
New Iberia—Monroe
Cotton Valley—Greggton
Magnolia—Houston

Arkansas Fields

Three new producers added at Magnolia

El Dorado, Ark.—The Magnolia field, Columbia County, continued as South Arkansas' most active pool with the addition of three new producers from the 7500-foot Smackover lime pay, and staking of locations for two additional tests.

The new producers were added by Placid Oil Company at Couch 1, Section 19-17-19, an east-edge well; G. H. Vaughn at Paschal 1, Section 22-17-20; and Shell Oil Company's Peoples Bank 1, Section 24-17-20. Two other wells were waiting on cement on producing strings of casing and another operation was coring. The per-well allowable in the field is 300 barrels daily.

The third producer for the recently-opened Glen Rose lime field southwest of Stamps, Lafayette County, was completed last week by Erwin & Leach and East Texas Refining Company at Warren A-1, C N½ NE NW 24-16-24, ¼-mile northwest of the discovery. A gauge of the well was not immediately available but it gave indications of being the largest. Total depth is 3578 feet. Between the two producers, the operator's Patton B-1, Section 24-16-24, had set casing at 3505 feet.

Three eighths of a mile southeast of production, J. C. Stevens made location for McIvor 1, C N½ NW SE 19-16-23.

Southwest of Magnolia, the Columbia County wildcat of Atlantic Refining Company, Pine Woods 1, Section 16-18-22, drilled ahead toward the Smackover lime after a core in the Cotton Valley series from 6633-48 feet which showed a trace of oil. The county's new lime wildcat, Twin City Syndicate's Hollingsworth 1, Section 31-17-16, between the Village and Schuler fields, was below 2850 feet.

Two new producers were completed last week in the Schuler field, Union County, both operations of Lion Oil Refining Company, John 1 and Clay 2, Section 12-18-18. They were checked back to the field allowable without initial gauges. The company made locations for two new tests.

In Bradley County, the Smackover lime wildcat of Amerada Petroleum Corporation at Bradley 1, Section 14-17-10, drilled ahead after setting 8⅝-inch casing at 1181 feet.

Seven Arkansas permits

El Dorado, Ark.—Seven drilling permits, four of them in Columbia County, were authorized last week by the Arkansas Oil & Gas Commission as follows:

Columbia County—Atlantic Refining Company's Foster 2, C SW NE 24-17-20; Oliphant Oil Company's Jones 1, C SE SE 16-17-20; Phillips Petroleum Company's Walthall 1, C SE SW 15-17-20; and Joiner Unit 1, C SW NE 22-17-20.

Howard County — William James' I. M. Rooks No. 1, SEc NW NW 2-8-27.

Union County — Lion Oil Refining Company's Clay 3, SEc SE SW 12-18-18 and Justiss 2, S½ NW NE 19-18-17.

California Fields

Coles Levee proven major San Joaquin Valley field

Los Angeles. — What undoubtedly proves Coles Levee, Kern County, to be one of the major fields on the floor of the San Joaquin Valley was completion of Standard Oil Company's KCL 20-1, Section 9-31-25, for an initial yield of 2200 barrels of 53.6 gravity oil per day along with 30,000,000 cubic feet of gas from 9216 feet. This well extends the field northwest and geologists say it indicates heavier production where Richfield Oil Corporation brought in the Western-Tupman wildcat well several months ago.

Coles Levee is now accepted as a major deep zone field in the valley because heretofore completions along the north edge of Buena Vista Lake bed have not been spectacular. Coles Levee now is believed to be similar to the great East Coalinga Eocene pool in Fresno County.

KCL 20-1 found the Stevens sand higher than any other and widened the pool one mile west of Ohio Oil Company's F-1, discovery well. Standard is preparing site for an offset to the west.

West Montebello Extension operations increase to 40

Los Angeles.—Entry of a number of smaller operators who normally are not interested in drilling so deep has resulted during the last 60 days in an increase in operations at West Montebello Extension to the point that 40 tests are at various stages. Of 25 tests drilling below 7000 feet, 15 belong to smaller operators and 10 are divided between Standard Oil Company of California and Union Oil Company.

Superior Oil Company's PV-1, important wildcat near Coalinga, Fresno County, got tied up in a fishing job at 8360 feet. The company is endeavoring to cement fish in place to enable resumption of drilling operations. No showings are yet in sight.

In the East Coalinga Eocene pool, Robert S. Lytle brought in No. 75-7F for 1600 barrels of clean 28.2 gravity oil per day from 8150 feet. Gatchell zone was tapped at 7570 feet. Lytle's No. 5-18F, Section 18-20-16, is slated for completion this week in the Gatchell.

General Petroleum Corporation is expected to launch a wildcat test on the Sullivan ranch between Greeley and Rio Bravo fields. The Sullivan wildcat will endeavor to extend the Vedder production of Greeley field about 2 miles northwest to Section 12-29-25.

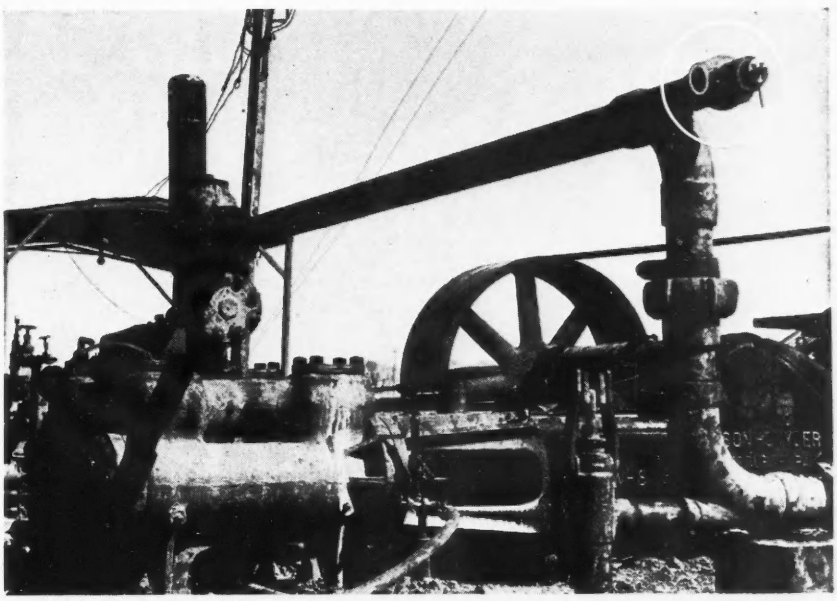
North Belridge field, Kern County, which is one of the best producers in California, remains quite active because of the large interests controlled by Belridge Oil Company, which has three active strings. At the north tip of the field, Richfield Oil Company and Tide Water Associated Oil Company are drilling.

Reports are current that several major oil companies may revive the search for an oil pool thought to lie close in to the city of Oxnard in the coastal area where an intensive hunt for oil was made several years ago. Ranchers near Oxnard are still convinced that commercial production will be developed and report that Shell Oil Company is working between Oxnard and Hueneme, while General Petroleum is considering the drilling of another well on the McGrath ranch. Superior Oil Company also is reported to be leasing around Saticoy, apparently with the view of drilling a wildcat late this summer.

California Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Los Angeles County (Athens Rosecrans)—		
Bankline, Kerby 1	87	7669
Los Angeles County (Montebello West)—		
Standard, Braun 2	995	7652
Braun 3	293	7625
Union, La Merced 32	1250	7660
Los Angeles County (Torrance Extension)—		
J. E. O'Donnell, No. 72	480	5420
Los Angeles County (Torrance)—		
C. C. M. O., Kettler 12	73	5119
Lebow-McNee Oil, Kettler B-3	125	5160
Los Angeles County (Wilmington)—		
General, Blinn 5	156	3250
SP (LB) 7	1275	4080
Long Beach Oil Dev. Co., "Y" (LB) 5	450	3989
Wilton Oil, No. 8	220	2956
Kern County (Arvin)—		
Standard, Jewett 2-2	1860	6300
Fresno County (East Coalinga Eocene)—		
R. S. Lytle, No. 75-7F	4776	8150
No. 5-18F	2640	7486
Texas Co., Exeter 1	1270	8165
Kern County (Kern River)—		
Italo, Judkins 1	20	1286
Kern County (Rio Bravo)—		
General, Van Ness 2	2200	11514
Kern County (Round Mountain)—		
Crestmont, Staley 6	130	1575
Ventura County (Ventura Avenue)—		
General, Barnard 17	942	8350

*Failures; †Junked; ¶Million cu. ft. gas.



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New Mexico Fields

Large acreage opened in Loco Hills area

Hobbs, N. M.—Expansion of the Loco Hills pool, Eddy County, 1 mile to the southwest and the completion of a semi-wildcat producer to the west of the recently discovered oil area opens a large amount of acreage for development. Continental Oil Company and Martin Yates' Julia Brainard 1, NE NE NW 11-18s-29e, enlarged the pool in filling 1400 feet with oil after drilling with tools to 2649 feet, with an elevation of 3521 feet. Seven-inch pipe has been cemented on top of the first saturated zone at 2569 feet to complete. Continental Oil Company and S. P. Yates' Travis 1, SE SE SE 3-18s-29e, was drilling at 1610 feet.

Underwood and Sanders' State-Langford 1, C SW SW 9-18s-29e, 1½ mile southeast of a wildcat producer and possibly a continuation of the Loco Hills area, is rated at 100 barrels daily after conditioning the hole. The broken lime pay at 2428-55 feet was shot with 120 quarts of nitro after plugging back from dry lime at 2565 feet to 2455 feet, with an elevation of 3488 feet. The partnership's P. E. Miller 1, C SE NE 5-18s-29e, is showing for a commercial well, although gauge has not been completed, after 220-quart nitro shot at 2560-2620 feet. It has an elevation of 3547 feet. Ralph W. Fair et al's State 1, NE NE SW 1-18s-29e, ¾ mile west of the Loco Hills discovery, was flowing 150 barrels daily through casing after 80-quart nitro shot at 2727-52 feet, with the hole bottomed at 2763 feet.

Operators in Eddy County fields have enjoyed higher production allowables than those applied to Lea County for more than a year. The proration schedule for July lowers the output for the state 900 barrels to 116,100 barrels daily. The well quota in Lea County was cut 1 barrel to 52 barrels daily, while prorated wells in Eddy County have been assigned a top allowable of 71 barrels, representing a 7-barrel reduction because the crude export outlet was cut from 4000 barrels to 3000 barrels daily. Only 55 wells in Eddy County and the Maljamar sector of Lea County can yield their top allowable.

Field activity in Lea County declined the past week to 4 new tests as compared to 8 the previous week, and all were assigned to the east portion of the county. The productive lime area situated between the Penrose and Eunice fields gained two of the operations. Repollo Oil Company's State 3-D-157, NW NW SE 12-22s-36e, southeast edge location, flowed 275 barrels of oil natural in 10 hours for completion at 3745 feet, with an elevation of 3474 feet. Gulf Oil Corporation's Mattern 7-E has started up as a north offset. Texas Pacific Coal & Oil Company's State 17-A, an inside test, was running tubing to complete at 3790 feet, or 277 feet subsea, and rig was skidded to drill State 18-A, NE SW NE 11-22s-36e. In the Penrose field, Devonian Oil Company's Christmas 2, SW SW SE 28-22s-37e, is a new location.

Two natural-flowing wells in the Lovington pool were in process of completion last mid-week. Magnolia Petroleum Company's State 2-R, C NE SE 1-17s-36e, gauged 313 barrels of oil in 13 hours through tubing choke after drilling to 4960 feet, or 1130 feet below sea level. Filled lease tankage has delayed the potential gauge. Amerada Petroleum Corporation's State 2-A-L, 2 locations west of the above well, kicked off with a steady flow when swabbed down through tubing, with the hole bottomed at 4944 feet, or 1108 feet subsea. It was drilled in with oil, and completion gauge was deferred until the well cleans itself of the drilling fluid. Ten direct offsets to completed oil wells are due in the pool, and the majority will likely be started in the near future. The Texas-New Mexico Pipe Line Company was scheduled to complete its 16-mile 5½-inch crude line extension into the Lovington area late last week, thereby enabling operators to discontinue tank truck shipments to Hobbs.

Magnolia Petroleum Company's Corrigan 3, located near the Eunice townsite sector of the Hardy field, registered a potential of 425 barrels after 190-quart nitro shot at 3660-3758 feet. The company has moved rig to drill Carson 6, C SW NW 33-21s-37e, offsetting production.

Continental Oil Company et al's Lynn 2-A-28, C NW SE 28-23s-36e, situated between the Lynn and Cooper fields, gauged 23 barrels of 36-gravity oil natural per hour through ¾-inch choke, with gas volume rated at 517,000 feet daily. This test logged lime pay at 3587-96 feet followed by oil sand at 3638-43 feet, and a second lime zone at 3661-67 feet. It was drilled to 3680 feet.

New Mexico Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Eddy County—		
Arnold et al, Arnold 1-B, nw nw nw 34-17s-30e	35	3360
Lea County (Hardy)—		
Humble, Hardison 1, c sw ne 34-21s-37e	62	3730
Magnolia, Corrigan 3, c sw se 33-21s-37e	425	3758
Lea County (Langlie)—		
R. Olsen Oil Co., Langlie-Stanolind 1, se nw nw 10-25s-37e	336	3440
Richmond Drl. Co., State-Texaco 3-A, c se sw 2-25s-37e	306	3378
Lea County (Lynn)—		
Continental et al, Lynn 2-A-28, c nw se 28-23s-36e	552	3680
Lea County (Mattix)—		
Great Western Producers, Inc., State-Gulf 3-B, ne nw 32-23s-37e	150	3564
Humble, State 1-L, c ne se 32-24s-37e	10	3560
Lea County (Vacuum)—		
Magnolia, State-Bridges 34, c se sw 14-17s-34e	478	4650
Shell, State 3-N, c sw ne 28-17s-35e	315	4681

*Failures; †Junked; ¶Million cu. ft. gas.

Rincon gets unusual 20-acre spacing order

Unusual spacing rules for the Rincon Field, Starr County, are provided in a new Railroad Commission order. The rules call for one well to 20 acres, but wells may be only 660 feet apart in a north-south direction, but must be 1320 feet apart east and west. The field is to be prorated on acreage and per well with 50 percent allocated on each factor and maximum of 35 acres assignable to the final well on the lease.

The rules call for 850 feet of surface casing cemented to the surface and an oil string cemented 800 feet above the shoe. A maximum gas/oil ratio of 2000/1 is provided.

Rocky Mountain Area

Third Sunburst producer extends Cut Bank northwest. Contract test northeast of Casper after geophysical survey. World's highest test in Colorado drilling below sea level.

Casper, Wyo.—Continental Oil Company has announced a deep test to be drilled on the North Geary Dome structure, 7½ miles north of Casper, on the western rim of the Powder River Basin in Natrona County. The announcement was made following an extensive geophysical survey conducted by the company over an area of some 70,000 acres during the past several months. A drilling block of 15,000 acres has been taken and will be tested to the Sundance sands.

Location for the test has not yet been officially released. Contract for the hole was awarded to Manning & Martin, rotary contractors, who will spud by August 1 under the terms of the agreement. The North Geary structure is the central dome in a series of 3 lying on the Salt Creek line of folding to the west of the Cole Creek field. The Northern, or Midway Dome, has been proven commercially since 1930 when the discovery well was drilled by Midwest Refining Company. Deepening operations are also planned for several wells on this structure to test lower formations. Present production in the field is found in the Wall Creek sands and holes are to be deepened to the Dakota formations.

No oil test has been drilled on North Geary Dome although a number of surveys have been made in the area by Phillips Petroleum Company and others. The structure is given a closure of around 800 feet by geologists and geophysicists, with around 12,000 acres within the closing contours. Later testing may include the South Geary dome, southernmost structure of the series.

Southwest of Cole Creek

The structure is six miles southwest of Cole Creek, where General Petroleum Corporation a year ago brought in a 400-barrel well from the Lakota sand at 7974 feet to 8013 feet in Government 1, CNW NW SE 21-35n-77w. The company since drilled State 1, a mile due north, which developed water in all sands down to and including the Sundance. Subsequently deepening, Government 1 encountered water in the Sundance, and was plugged back through the Lakota into the 6-inch casing on top of the sand. Perforations in the Dakota from 7912 to 7930 feet yielded 100 barrels daily. This zone was then cemented off and the Mowry and Muddy sands perforated and tested, which showed better than 100 barrels daily. Finding simultaneous production from the four zones mechanically unfeasible, the Mowry-Muddy zones were cemented off preparatory to producing the Dakota-Lakota. Tubing was inadvertently cemented in the upper zones, and milling on tubing cemented in hole in a difficult fishing and clean-up job that has been in progress for the past three weeks.

Important Wildcats and Extensions

Several wildcats and important extension tests to proved fields scattered through Wyoming are at critical depths. On the Big Piney gas structure, Sublette County, Wyoming Petroleum Corporation's Charles Budd 1, CNE NE 10-29n-113w, which the past December blew in from shallow sands between 700 and 1200 feet for 40,000,000 cubic feet daily, blowing an accompanying heavy flow of water from surface sands into the freezing air to form a solid cone of ice around the derrick and rig, is drilling at 2030 feet. Objective sand is expected at 2100 feet. In the old Corder Oil Company test a mile and an eighth west a commercial showing of 46° green oil was encountered at 2230 feet. Hole was lost and well abandoned in 1932 following the rig firing while operators were attempting to fish three strings of tools dropped in hole. The Wyoming Petroleum Corporation test is drilling with rotary equipment and on resumption from winter shut down three weeks ago installed heavy blow-out preventor and heavier drilling equipment.

In the same area, J. H. Anderson Drilling Company of California is building derrick for Marbleton Townsite 1, CW NE 30-30n-111w. A third test in the Big Piney area, Yellowstone Oil Company's Henry Budd 1, SW SE SE 31-31n-112w, recently resumed from winter shut-down, is waiting on cement to set around 12½-inch casing at 428 feet.

Eight miles to the southwest of Big Piney, The Texas Company's Government 1, SE SE SW 1-28n-114w, on Dry Piney, was testing through the drill stem at around 6000 feet at successive levels after backing up from 8194 feet where bottom-hole portion of drill stem was left frozen.

Mountain States Completions

COLORADO

Company, Well and Location	Init. Prod. Bbls.	Depth
Moffat County (Thornburg Dome)—		
Mackinnie Oil & Drilling Co., Coles 1, se nw se 1-3n-92w	*	3484
MONTANA		
Carbon County (Mosser Dome)—		
R. C. Tarrant's Kelly 2, cel nw sw 26-3s-24e	*	975
Glacier County (Cut Bank)—		
Glacier Prod. Co., Hawkins 2, ne ne sw 17-33n-5w	94	2953
Nadeau Brothers, Crowley 2, csw nw 24-37n-5w	48	2696
Texas Co., Hessler 2, cnl ne ne 19-33n-5w	52	2967
Santa Rita Oil & Gas Co., Mcabe Permit 2, cse ne 29-33n-5w	30	3065
R. C. Tarrant, State 4, sw nw sw 36-34n-6w	*	2872
Toole County (Kevin-Sunburst)—		
Coolidge & Coolidge, State 5-A, sw nw 36-36n-2w	100	1563
O. A. Nepstead, Haugen 3, ne nw ne 11-35n-3w	19	1578
WYOMING		
Niobrara County (Lance Creek Field)—		
Continental Oil Co., Otto Rohlff 9, se ne se 31-36n-65w	720	3937
Sweetwater County (Lost Soldier Field)—		
Sinclair-Wyoming Oil Co., Lost Soldier 83, nw ne ne 10-26n-90w	100	2180

*Failures; †Junked; ¶Mil. cu. ft. gas.

Seek Lance Creek Extension

On the east end of the Lance Creek field, Niobrara County, Continental Oil Company's Apex 4-OPC 4, SE SE NW 35-36n-65w, is waiting on cement to set around the 7-inch casing on top the Leo sand with total depth at 4304 feet. Continental Oil Company has prospects of a good Sundance sand producer in Rodeo 6, NW NE 35-36n-65w, considerably east of the Sundance unit, waiting on cement to set around the 7-inch casing with total depth at 4090 feet. The casing is set at 4072 feet with the Basal Sundance topped at 4075 feet and 15 feet of sand penetrated with hole bottomed in the oil section. The well is an offset three eighths of a mile north and slightly east of Ohio Oil Company's Leo 1-OPC-7, 150 feet lower structurally than Continental Oil Company's extension test. The Ohio Oil Company well scheduled for Leo production plugged back for 300 barrels oil daily in Sundance after encountering water in lower sand. Important is that the outpost Sundance producer of Ohio Oil Company and the critical Continental Oil Company well will apparently establish a second Sundance fold on the Lance Creek anticline two miles east of the east unit boundary of the Sundance participating area, or may mean extension of the Sundance sand two miles east.

Minnelusa Oil Corporation's Marlene 1, NW SW SW 4-35n-65w, on the south side of the Lance Creek field, is waiting on cement to set around the 7-inch string set atop the Leo at 5482 feet with total depth at 5547 feet in sand.

Important extension on the hitherto undrilled south fault block of the Byron field, Big Horn County, Sidney H. Keoughan's Sheets-Government 1, SE NE SE 9-55n-96w, semi-wildcat, is underreaming to set 7-inch production casing on top the Peay sand (Third Frontier) at 3899 feet with total depth 3931 feet. On the down-throw side of the fault Keoughan is drilling for light oil possibilities in Frontier series. On the up-throw side in the Byron field, black oil production is developed in the Embar-Tensleep at 5300 to 5700 feet. Gas had been developed in the Frontier in the early days of Byron from 2500 to 2700 feet on the up-throw side.

Third Sunburst producing well among some 400 completions in Montana Cut Bank field, Glacier County, was brought in this week. Glacier Production Company's Larson 1, CWL NW NE 35-36n-5w, in addition extended proved oil limits three quarters of a mile northwest, completing for one of 1939's largest Cut Bank wells, swabbing 225 barrels in 22 hours. The well had the Sunburst from 3018 to 3028 feet, Upper Cut Bank from 3036 to 3111 feet and Lower Cut Bank from 3111

to 3118 feet. Hole bottoms at 3120 feet. Moulton sands from 2815 to 2885 feet and 2925 to 2950 feet were dry in the Larson well. The 3 Sunburst producers at Cut Bank are from 14 to 18 miles apart.

World's Highest

In Colorado, Amerada Petroleum Corporation, Continental Oil Company, and The California Company's David Miller 1, SW SW NW 36-8s-91w, wildcat on the Divide Creek structure, set a new Rocky Mountain depth record this week passing the 10,281 foot record established a year ago by The California Company drilling on Nesson anticline near Ray, North Dakota. Holding another record for the highest well drilled in oil annals with an elevation of 9395 feet, the well was only 1105 feet below sea level as it reached the 10,500 feet for world's highest-up and Rocky Mountain's deepest down.

Two Michigan refining plants ready to operate

Two skimming plants are scheduled to go on stream this month in Bloomingdale, Michigan, both outgrowths of the Southwestern Michigan oil boom, and only direct Michigan refinery growth attributed to the new shallow Michigan fields. Fort-Dale Oil & Refining Company has completed a 700-barrel skimming plant at Bloomingdale and will start operations July 15. Rae E. Lewis of Ovid, Michigan, is president of the company.

Glenco Refining Company, headed by Glenn Caldwell, will complete its 1000-barrel straight-run plant about July 20. It also is located at Bloomingdale.

TOM DAMBACK, with Halliburton Oil Well Cementing Company for several years, has resigned to take charge of the Cryden Oil Company's Southwestern Michigan producing department.

Michigan Fields

Ottawa County wildcat shows indication of opening field. Van Buren County's second producing spot is indicated.

Mt. Pleasant, Mich.—First rank wildcat oil discovery since March appeared in the making for Michigan this week as Smith Petroleum Company and Strom-Wagner Trustees' Wisniswski 1, SE SE SW 27-7n-13w, Tallmadge Township, Ottawa County, showed 1500 feet of oil in Traverse lime at 1897 feet, where drilling was halted for orders. The test is approximately four miles west of the Walker field, Kent County, but structurally low dry holes on the west side of the Walker field appear to preclude the test as marking a 4-mile extension.

Before testing the 1500-foot Traverse oil show, the Ottawa wildcat already had reached the record books as a Berea gas discovery. In the Berea at 1060-1120 feet, it gauged 9,180,000 cubic feet of dry gas per day. Gulf Refining Company and Sun Oil Company are reported holding big acreage spreads in the new Ottawa County play.

Of 26 drill permits issued for the week only one was for a wildcat. It is Chapman Oil Company's Bagley 1, SW SW 10-16n-1w, Edenville Township, Midland County, approximately a mile south of a Sun Oil Company dry hole and two miles north of the Edenville pool, which produces from Dundee lime.

Completions totaled 28, including three wildcats, all in Southwestern Michigan. One was Century Oil Company's Victory 1, Section 27-6n-13w, six miles south of the Smith-Strom-Wagner wildcat well.

Blood & Hendershoot's Jackson 1, Section 29-2s-16w, Van Buren County, bottomed at 2551 feet for test. It is the first wildcat this year to reach Trenton lime in Southwestern Michigan. Trenton was topped at 2475 feet and drilling carried to 2551 feet with a hole full of water from upper beds. Drillers believed they went through a light gas pay in the Upper Trenton.

Smith & Strom-Wagner's wildcat in Tallmadge Township, which looms as a commercial well, will mark the second wildcat in the county to produce. However, the one previous discovery credited to the county is only a 10- to 20-barrel pumper and efforts to establish production near it, including a direct offset, so far have failed. This test was drilled by Carscallen & Anderson (Longnecker 1, Section 4-7n-13w), last winter. It is five miles due north of the new wildcat. About 50 wildcats all told have been drilled in the county.

Michigan Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Allegan County—		
A. F. Shaw, Gietzen 1, nw ne nw 8-4n-12w	*	1802
Socony-Vacuum, Heibel 1, se ne se 2-4n-13w	50	1681
Loew 1, se sw se 3-4n-13w	120	1630
W. R. Borough, Inc., Shuck 1, sw sw nw 2-4n-13w	80	1667
Gordon Oil Co., Miller A1, ne nw ne 10-4n-13w	350	1628
Muskegon Oil Co., Homrich 2, sw se ne 11-4n-13w	50	1575
Redman Oil Co., Fee 5, nw se ne 22-4n-13w	75	1576
Clare County—		
Taggart Inc., Smith 5, c nw 24-18n-6w	¶1½	1509
Pure, Switzer 4, n ne sw 27-19n-6w	125	3912
State A3, e e nw 33-19n-6w	2700	3884
Kent County—		
Wolverine Nat. Co., Orlik 2, se ne nw 5-6n-12w	25	1795
Swanson Oil Co., Van Dyke 2, ne sw ne 5-6n-12w	2600	1767
Monroe County—		
A. V. Oil Co., Roe 1, sw se nw 30-6s-6e	¶	2129
Ocena County—		
White Rivers, Fee 1, ne se nw 27-13n-16w	*	2454
Ottawa County—		
Century Oil Co., Victory 1, nw nw se 27-6n-13w	*	1705
Van Buren County—		
Little Four, Ryan 1, sw nw sw 22-2s-16w	*	1050
Blood & Hendershott, Murray 1, nw nw nw 27-2s-16w	*	1060
Bert Goen, Harris 1, se sw sw 6-1s-14w	*	1241
Mesel & Spielbergs, Kahl 2, sw sw se 6-1s-14w	5	1225
Bloomingdale, Decker 5, sw sw se 7-1s-14w	60	1208
Wiser Oil Co., Boyer 11, sw ne nw 17-1s-14w	75	1211
Leman, trustee, Smith 2, se nw ne 11-1s-15w	40	1186
O. O. Borden, Parisian 2, nw sw ne 13-1s-15w	1350	1203
Parisian 3, ne se nw 13-1s-15w	900	1207
Bridger Basin, Parisian 2, ne sw nw 13-1s-15w	*	1230
M. M. Rozan, Post 1, nw ne ne 13-1s-15w	70	1204
Clapsaddle, Pepper 4, se nw nw 24-1s-15w	300	1159
Glenn Mcoun, Filip 1, sw sw ne 18-13s-13w	*	1360

*Failures; †Junked; ¶Mil. cu. ft. gas.

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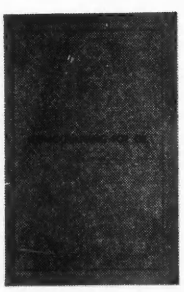

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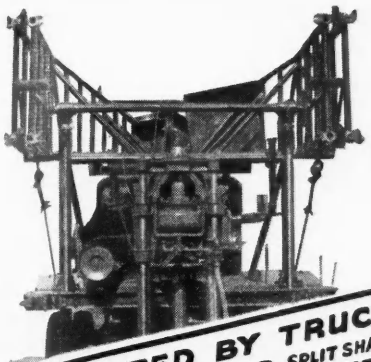

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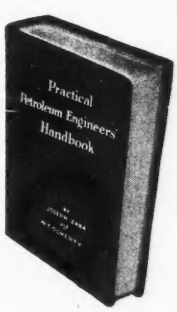

By JOSEPH ZABA, E. M. M. Sc.
Petroleum Engineer, Rio Bravo Oil Co.
and
W. T. DOHERTY
Division Superintendent
Humble Oil & Refining Company

For a number of years there has been a growing demand for a handbook containing formulae and other practical information for the benefit of the man working in the production and drilling branches of the oil industry. So great has been this need that many engineers have tried to accumulate their own handbooks by clipping tables, formulae and figures from scores of sources.

The co-authors of this volume discovered by coincidence that each had been for a period of several years accumulating practical data which through their collaboration appears in this book. Both of them are men who have not only received theoretical training but who have had many years of practical experience as engineers in dealing with every day oil field drilling and production problems.

As a result of this collaboration of effort the publishers of this volume feel that it is a most valuable contribution to oil trade literature.

Its purposes are distinctly practical. The tables, formulae, and figures shown are practical rather than theoretical in nature. It should save the time of many a busy operator, engineer, superintendent, and foreman.

TABLE OF CONTENTS

Chapter I — General Engineering Data
Chapter II — Steam
Chapter III — Power Transmission
Chapter IV — Tubular Goods
Chapter V — Drilling
Chapter VI — Production
Chapter VII — Transportation

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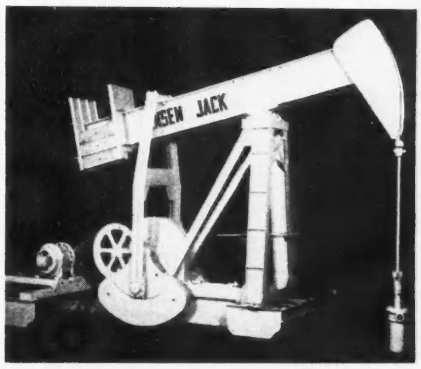
Thumb Your Nose at Trouble!



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WILDCAT REPORT
New Starts and Completions

CALIFORNIA
FIRST REPORTS

Los Angeles County—Bren Oil Co.'s No. 1, lcn 1000 ft s 200 ft w of c/ls Main and Sepulveda, Torrance extension.

Kern County—Richfield Oil Corp.'s Turk 1, lcn 1650 ft s 990 ft w nec 4-17-15, Coalinga, northern area. Francis L'Reilly's Edison-Seale 5-27, rig, lcn 150 ft s 150 ft w n¼c nw¼ 5-30-29, Edison area. Trico Oil & Gas Co.'s 1, lcn 500 ft s 1300 ft w nec 17-4-21, Ojai Trico area.

Ventura County—Coronet Oil Co.'s Coronet T.G.T. 2, rig, lcn 660 ft s 430 ft w 2-25-23, area.

Humboldt County—Texas Co.'s Eureka 3, lcn 2978 ft n 3340 ft e swc 21-3n-1w, Tompkins Hills area.

COMPLETIONS

Fred Cole's Ferrini 1, abnd 4753 ft; bottomed in Franciscan, top Foxen 1570 ft, 550 ft n 200 ft w sec Ferrini property, 15-10-35, elev 103 ft.

COLORADO
COMPLETIONS

Moffat County—Mackinnie Oil & Drilling Co.'s Coles 1, se nw se 1-3n-92w, Thornburg Dome, abnd 3484 ft.

ILLINOIS
FIRST REPORTS

Coles County—Marvin et al's J. H. Bell 1, sw se se 28-12n-7e, dr.

Jefferson County—Mrs. L. E. Phelps' H. H. Peterson 1, se se 23-2s-1e, Casner tnp, 1 mile east of Woodlawn, dk.

Jersey County—L. A. Reed's (Jersey Oil Syndicate's) Grover Pearce 1, sw c ne 27-8n-10w, loc.

Moultrie County—George Anderson's Ullrich 1, c w½ nw nw 29-15n-5e, rig.

Richland County — Leathers et al's Roy Milone 1, nw nw ne 21-3n-14w, Claremont tnp, moving in materials.

Wabash County—Dallas Hawkins' Cowling 1, se ne se 18-2s-13w, northeast of Cowling, sp. C. D. Neff's Bump 1, nw ne nw 9-2s-13w, ½ mile northeast of Keensburg, moving in materials.

Washington County—W. R. Curry's P. & W. Krughoff 1, se nw nw 10-3s-3w, rig.

Wayne County—Illinois Mid-Continent Oil Co.'s Sarah Harris 1, nw se ne 3-3s-8e, rig. Illinois Mid-Continent Oil Co.'s Vaughan Heirs 1, c n½ ne sw 2-3s-8e, dr. Kenyon Oil Co.'s G. T. Vaughan 1, sw ne nw 1-3s-8e, rig.

COMPLETIONS

Bond County—Eason Oil Co.'s Joint Land Bank 1-A, ne ne nw 24-4n-3w, Mills tnp, abnd 1155 ft.

Clark County—E. R. Brann et al's J. F. Baughnan 1, ne nw se 20-9n-14w, Johnson tnp, abnd 1027 ft.

Crawford County—Soard Oil Co.'s (Producers Oil & Development Co.'s) Snyder 1, se se nw 7-9n-13w, Licking tnp, abnd 1385 ft.

Gallatin County—F. R. Jackson's (J. Zeffa's) Turner 1, c nw 27-9s-9e, Gold Hill tnp, abnd in Rosiclare lime at 2717 ft.

Lawrence County—Edward Gieck's Harry Gutteridge 2, c s sw nw 32-3n-12w, Lukin tnp, top Ste. Genevieve 2160 ft, abnd 2280 ft.

Marion County—J. Lickey's Quick 1, sw nw se 35-3n-1e, Carrigan tnp, top MCclosky 1975 ft, abnd 2050 ft.

Washington County — Pres. Cochrane & Clyde Murray's Gebhart Roadway 1, ne ne nw 15-3s-3w, Pilot Knob tnp, top Benoist 1285 ft, abnd 1305 ft.

INDIANA
FIRST REPORTS

Posey County—W. T. Mellow's Keck's Estate 1, ne 34-3s-14w, Bethel tnp, loc.

COMPLETIONS

Posey County—Superior Oil Co.'s Ribeyre Island (New Harmony Realty) 1, sw nw sw 10-5s-14w, Harmony tnp, top Waltersburg 2180 ft, started at 14 barrels an hour.

Vanderburg County—Eason Oil Co. & Glad Oil Co.'s Park Land 1, nw c se 14-6s-11w, City of Evansville, 6 miles northeast of Heusler pool of Posey County, top McClosky 2560 ft, abnd 2650 ft.

KENTUCKY
FIRST REPORTS

Daviess County—J. C. Preston's Jess Kelly 1, 2 miles northeast of Yelvington, dr.

STATE	WILDCATS STARTED		WILDCAT TESTS COMPLETED							
			Total		Oil		Gas		Dry	
	This Week	This Year	This Week	This Year	This Week	This Year	This Week	This Year	This Week	This Year
Alabama	...	3	...	1	...	...	...	...	...	1
Arkansas	...	18	...	14	...	1	...	...	...	13
California	5	128	1	65	...	19	...	1	1	45
Colorado	...	...	1	1	...	...	...	...	1	1
Florida	...	1	...	1	...	...	...	...	...	1
Georgia	...	3	...	1	...	...	...	...	...	1
Illinois	11	289	7	207	...	17	...	...	7	190
Indiana	1	19	2	18	1	6	...	...	1	11
Kansas	11	137	5	112	2	39	...	3	3	70
Kentucky	1	11	...	13	...	7	...	...	...	6
Louisiana	3	69	...	51	...	8	...	...	...	43
North Louisiana	...	23	...	16	...	3	...	...	...	13
South Louisiana	3	46	...	35	...	5	...	...	...	30
Michigan	1	111	3	156	...	12	...	...	3	144
Mississippi	...	5	...	3	...	...	...	...	...	3
Missouri	1	23	...	4	...	...	...	...	...	4
Montana	...	1	...	1	...	...	...	...	...	1
New Mexico	1	22	...	8	...	1	...	1	...	6
New York	...	...	...	2	...	1	...	1	...	...
Oklahoma	4	97	4	96	1	13	...	5	3	78
Ohio	...	3	...	7	...	1	...	...	...	6
Pennsylvania	...	2	...	2	...	...	...	...	...	2
South Dakota	...	1	...	...	...	...	...	...	...	...
Texas	21	564	21	575	4	61	...	6	17	508
East Texas	3	67	1	52	...	3	...	1	1	48
North Texas	1	79	3	124	...	21	...	1	3	102
Gulf Coast	2	60	...	46	...	3	...	...	...	43
Panhandle	...	6	...	6	...	...	...	...	...	6
South Texas	11	235	13	251	1	21	...	3	12	227
West Texas	4	117	4	96	3	13	...	1	1	82
Utah	1	1	...	...	...	...	...	...	...	...
West Virginia	...	2	1	1	...	...	...	...	1	1
Wyoming	1	2	...	1	...	...	...	...	...	1
Total U. S.	62	1,513	45	1,344	8	186	...	18	37	1,140

KANSAS
FIRST REPORTS

Coffey County—Sackrider et al's Allen 1, se ne se 13-21s-15e, dr 375 ft.

Cowley County—Eason Oil Co.'s Muret 1, se se ne 25-33-3e, rur.

Greenwood County—C. L. Sheedy's Fee 1, ce½ ne nw 13-25-12e, dr 300 ft. J. Enright's Schwab 1-A, se sw se 9-24-10e, spd and sd.

Kingman County—Skelly Oil Co.'s Royse 1, c sw 9-28-11w, lcn.

Leavenworth County — Frank Hardaway's Schellar 1, sw se sw 30-10-22e, 10-in. at 44, sg 327 ft, sd 345 ft.

Rice County—Hollow and Bridgeport Machine Co.'s Guldner 1, ce½ se se 5-18s-9w, dr 460 ft. Skelly Oil Co.'s Bernstarf 1, csl se se 22-19s-10w, rig.

Sherman County — Goodland Independent Gas Co.'s Wilcoxson 1, sw nw 27-8s-39w, td 1100 ft in lime, 25,000 cu ft gas.

Stafford County—Virginia Drlg. Co.'s Teipermann 1, ne ne sw 29-21-12w, dr 1250 ft. Continental Oil Co.'s Keller 1, se se se 15-24-13w, lcn.

COMPLETIONS

Rice County—Lauck & Moncrief's Schoonover 1, sw sw se 20-18s-9w, abnd 3004 ft. Lario Oil & Gas Co.'s Link 1, se se sw 17-19s-9w, Lansing 2915, abnd 3285 ft. Central Pet. Co.'s Dipple 1, cnl ne se 27-19s-10w, Lansing 2971, slight shows, Arbuckle from 3292 to 3313, swb 142 oil in 4 hours, pumped 100 bbls oil in 8 hours, potential 301 barrels, 18 percent water.

Russell County—Cities Service's Dutt 1, nw nw se 18-13s-14w, top Arbuckle lime 3131 ft, pump 62 oil 6 hours, treated with 1000 acid and pumped 80 in 8 hours, cutting 2 percent water. Potential 241 bbls.

Sumner County—E. B. Shawver's Hitchcock 1-C, cn½ ne ne 16-30s-1w, Topeka 2156 ft, Mississippi lime 3557 ft, abnd 3625 ft.

SOUTH LOUISIANA
FIRST REPORTS

Avoyelles Parish—Adams Oil & Gas Co.'s Avoyelles Parish Poor Farm 1, Marksville area, 500 ft s of w line, 580 ft fr s line sec 8-2n-4e, mim.

Calcasieu Parish—Louisiana Gulf Coast Drilling Co.'s Langdom 1, Toomy area, 4421 ft w and 1237 ft n of sec sec 13-10s-13w, lcn.

Lafourche Parish—Tide Water's Delta Farms 1, Lake Salvadore area, 1980 ft s, 1980 ft e of nwc of sec 6-17s-23e, lcn.

St. Martin Parish—Shell's Iberville Land 1, Happy Town prospect, 2000 ft e, 475 ft s of nwc of sec 86-7s-8e, lcn.

COMPLETIONS

Iberville Parish—Shell's Natalbany Lbr. Co. 1, St. Gabriel prospect, 467 ft s of n line, 467 ft w of e line of sw¼ sec 18-9s-2e, dr to 10,542 ft, tested 9075 ft, 9050 ft, 9045 ft, and 9035 ft. Last test showed 124 bbls 20.4 gr oil and 148 bbls salt water, abnd.

St. Mary Parish—Percy S. Cooney's Allain 1, 1640 ft n, 13 degrees 10 minutes e from swc of sec 46, thence 78 ft s, 76 degrees, 50 minutes e at right angles in sec 46-13s-9e, se of Jeanerette field, salt water sands 2600 ft, abnd.

MICHIGAN
FIRST REPORTS

Midland County—Chapman Oil Co.'s Bagley 1, sw sw 10-16n-1w, dr.

COMPLETIONS

Allegan County—A. F. Shaw's Gietzen 1, nw ne nw 8-4n-12w, Traverse 1770 ft, abnd 1802 ft, dry.

Oceana County—White River Land Co.'s Fee 1, ne se nw 27-13n-16w, abnd in Traverse-Dundee, td 2454 ft.

Ottawa County—Century Oil Co.'s Victory 1, nw nw se 27-6n-13w, Traverse 1633 ft, abnd 1705 ft.

MISSOURI
FIRST REPORTS

New Madrid County—Stephens & Uhri's No. 1, sw sw ne 22-1n-13e, lcn.

NEW MEXICO
FIRST REPORT

Eddy County—Fred Turner, Jr. et al's Cave-Nickson 1, c ne ne 30-18s-26e, lcn.

OKLAHOMA
FIRST REPORTS

Cleveland County—Sinclair Prairie's Ward 1, se se se 30-7n-1e, lcn.

Lincoln County—Cooper Drlg. Co.'s Mefford 1, nw nw se 12-16-4e, lcn.

Pottawatomie County—Yorkan Prod. Co.'s Hoffman 1, nw nw nw 26-11-3e, ru. Neustadt's Howeth 1, ne se ne 14-6n-4e, mim.

COMPLETIONS

Hughes County—Phillips Pet. Co., Beeker 1, ne nw sw 6-5n-10e, Viola 5616 ft, 28 mil gas

Cromwell, pumped 100 oil, 900 water, completed at pb 5639 ft, td 6283 ft.

McClain County—ITIO's Lambert 1, ce½ nw ne 6-5n-2e, Viola 5280 ft, Wilcox 5675 ft, ran electrical log to 5716 ft, abnd.

Pontotoc County—L. Walker's King 1, sw se nw 5-4n-7e, abnd hfw 1203 ft.

Pottawatomie County—H. L. Berkey's Dowell 1, sw ne nw 33-8n-4e, Hunton 3877 ft, Viola 4340 ft, Wilcox 4595 ft, abnd 4613 ft.

EAST TEXAS

FIRST REPORTS

Anderson County—R. H. Williamson et al's O. G. Rogers 1, 150 ft out of nwc of se¼ of ne¼ of Wm. Greenwood sur, or 1150 ft fr ne and 1600 ft fr nw lines of survey, 6 mi sw Elkhart, lcn.

Ellis County—Compton Oil Co.'s M. L. Van Landingham 1, 200 ft ne of sw line and 2450 ft se of nw line of O. Wheeler (south) survey, 3 mi e Pluto, rig.

Limestone County—Zephyr Oil Co.'s Carrie Peoples 1, 800 varas w of m/e/e line and 900 varas s of m/e/n line of R. Scott sur, 1½ miles sw Tehaucanna, dr 1020 ft.

COMPLETIONS

Freestone County—John R. Bunn et al's T. H. Robinson 1, 1389 ft fr s and 2633 ft fr e lines of J. L. Bennett sur, 4 mi e of Streetman, elev 383 ft, top Austin chalk 2941 ft, abnd in chalk 2948 ft.

NORTH TEXAS

FIRST REPORTS

Clay County—E. Carlisle Norwood et al's W. H. Shipley 1, 150 ft north of center of south line of block 29, Madison County School Lands, A-302, lcn for Strawn test.

COMPLETIONS

Archer County—H. H. Fraser et al's W. M. Coleman 1, 330 ft out of nec blk 56, L. P. Hunt sub-div, Gunsight lime 1608-20 ft, abnd in Canyon 2480 ft. Underwood Oil Co.'s G. A. Key 1, 150 ft fr n and 1080 ft fr w lines blk 1, Meade Pasture sub-div, show o&w 1444-48 ft, abnd.

Clay County—L. T. Burns et al's C. L. Wynn 1, 330 ft fr e and 990 ft fr s lines lot 34, H. Williams sur A-704, abnd 5202 ft.

Montague County—W. M. Frank et al's W. G. & C. C. Cochran 1, 150 ft s and 450 ft e of sec of Campbell tract, W. R. Gaston sur A-302, but in W. Harvey sur A-329, 4 miles ne Ringgold, abnd 2006 ft.

WEST TEXAS

FIRST REPORTS

Ector County—Jack D. Bodkins et al's H. S. Foster-Humble 1, c se ne T&P sec 12, blk 43, T-3-S, lcn.

Jones County—Ralph R. Carroll et al's G. Herndon 2, 1775 ft fr n and 10,540 ft fr e lines of Goliad County School League No. 359, or 600 ft n of Herndon No. 1, rur.

Reeves County—Forest Development Corp.'s I. E. Scott 1, c se¼ of H&GN sec 286, blk 13, 11 miles e of Balmorhea, rur for Delaware test.

Ward County — Magnolia Pet. Co.'s Geo. Sealy 1-44, se se ne sec 44, blk F, CCSD&RGNG sur, dr 210 ft.

COMPLETIONS

Ector County — J. T. Banres-Conkling & White's E. R. Thomas 1, 1003 fr fr s and 1039 ft fr w lines nw¼ T&P sec 28, blk 45, T-1-S, elev 3277 ft, top anhydrite 1445 ft, top salt 1490 ft, top Yates 2710 ft, top brown lime 3530 ft, top solid lime 3790 ft, show free oil 4334-52 ft, abnd in sul water 4542-4752 ft.

Howard County—T. G. Shaw, Tr. and The Texas Co.'s Wilkinson 1-B, 990 ft fr n and 330 ft fr e lines T&P sec 19, blk 34, T-1-N, elev 2463 ft, top anhydrite 1152 ft, top Yates 1770 ft, top lime 2745 ft, abnd 4704 ft.

Jones County—E. C. Lawson et al's A. M. McNair 1, 330 ft out of nwc of 50-acre tract, lot 3, blk 5, Mary Lawson sur, abnd 2185 ft.

Pecos County—A. Leidecker & W. E. Kenney's M. M. Lehn-Texaco 1, 330 ft fr ne and se lines H&GN sec 71, blk 10, elev 2444 ft, top anhydrite 555 ft, pay 1719-43 ft, td 1783 ft, pb to 1745 ft, shot 90 quarts nitro 1672-1743 ft, flowed 10 bbls oil initial.

SOUTH TEXAS

FIRST REPORTS

Bexar County—Joe A. Noake's G. M. Griffin 1, 150 ft w line of 113.89-ac tr, 230 ft s RR. R. Kirby sur 195½, locn.

Caldwell County—Magnolia Petroleum Co.'s Morris Heirs 1, 330 ft ne line, 330 ft se line, 330-ac tr, in Moses Gage league, 2 mi ne McMahon, locn.

Gonzales County — E. E. Young's R. G. Moore 1, from s corner of 276-ac tr, nw along sw line 2140 ft; thence 165 ft ne at right angles to location in D. O. Warren sur, locn.

Jackson County—H. J. Porter's W. H. Dodd 1, 330 ft s line, 330 ft w line, of tr and E. Beaty sur, 2 mi ne Cordelle, locn.

Jim Wells County—Loring Bradstreet, Inc.'s Gertrude Rehment 1, 466 ft n line, 466 ft w line of e½ of 327-ac tr, lot 12, Morro Phillips sur, 1½ mi nw West Alfred field, locn.

LaSalle County—Johnson, Vivian & Shaw's L. Yeager 1, center of blk 7, sec 4, Wallace subd of Yeager Ranch, moving in materials.

Live Oak County—Sal Vieja Oil Corp.'s J. W. Hines 1, 330 ft s line, 330 ft e line of w 80-ac of se¼, sec 98, Dr. C. F. Simmons Farmlots subd, GC&SF RR sur 399, dr 300 ft.

McMullen County—C. C. Shumway's Shiner Estate 14, 330 ft w line, 2640 ft s line of e½ of e½ of sec 62, C. C. Shumway subd, Shiner Ranch, dr 400 ft. C. C. Shumway & C. H. Burns' Shiner Estate 5, 330 ft s line, 330 ft e line of w½ of s½ of blk 1, C. C. Shumway subd, Shiner Ranch, TT RR sur 5, rigging up; Shiner Estate 6, 330 ft s line, 330 ft e line of w½ of se¼ of blk 8, C. C. Shumway subd, Shiner Ranch, TT RR sur 5, locn.

Travis County—Burns Oil Co.'s Mrs. M. Benston 1, scales 3080 ft se line, 2360 ft ne line of 227-ac tr, Henry Martin sur 65, dr 1400 ft.

COMPLETIONS

Bexar County—Edwill Oil Co.'s Ridder 1, 800 ft n line, 1500 ft w line, 350-ac tr, J. M. Baerrera sur, abnd 865 ft.

Cameron County—Sal Vieja Oil Corp.'s Newberry 1, begin ne cor Share 3, San Martin gr, go 8765 ft se along ne line of sh 3, thence 2700 ft sw at right angles to locn, abnd 7585 ft.

Colorado County—Williams & Barnes' Tate 1, 2 mi nw Atair, abnd 3318 ft.

Duval County—R. L. Wheelock's R. Serna 1, 330 ft s and w lines sw¼ se¼ sec 290, abnd 4808 ft.

Jim Wells County—Texas Gulf Producing Co.'s E. E. Miller 1-A, from s cor 376.4-ac tr, go n along w line 467 ft, thence e 150 ft at right angles, San Antonio de Agua Dulce gr, ab 249, 3 mi ne Alfred, opens Reynolds field, flowed 22 barrels 37.5 grav oil 12 hours 5/64-in choke, 1850 pounds tubing pressure, 1950 pounds casing pressure through perforations 5143-49 ft, bottom of hole 5617 ft.

Kenedy County — Humble Oil & Refining Co.'s Kenedy 2, 18,200 ft e line, 7800 ft n line of Salinas sur in San Pedro de Las Molas gr, abnd 7706 ft.

Live Oak County—Luling Oil & Gas Co.'s Great Southern 1, 325 ft n line, 325 ft w line of farm tr 2987, blk 57, Dr. C. F. Simmons farmlots subd, 2 mi sw Simmons City, abnd 2065 ft.

McMullen County—F. H. Gohlke's E. L. Miles 1, 330 ft s line, 330 ft w line, blk 2, subd of the E. L. Miles Ranch, J. Poitevent sur 143, abnd 1197 ft.

Refugio County—Humble Oil & Refining Co.'s Thompson 3, 11,600 ft n of most s'ly s line, 4000 ft w of e line of Thompson Ranch in Patrick Downey sur, ab 18, abnd 6503 ft.

Travis County—O. G. Raesz's Swahn 1, 210 ft e line, 375 ft n line of 10-ac lse, Phillip McElroy sur, abnd 586 ft.

Webb County — Rowan and Hope, Inc.'s Laurel Brothers 1, 585 ft w line, 810 ft n line, blk 4, Neal subd, sur 1120, abnd 4010 ft. V. G. Schimmel's J. O. Walker 1, 990 ft s line, 1320 ft e line of sur 259 and in blk 13, abnd 1723 ft.

Willacy County—Midwest Royalty Co.'s Dayton 1, 660 ft e line, 667.5 ft s line of blk 8, San Matias Ranch subd of sh 47, San Juan de Carricitos gr, abnd 9005 ft.

TEXAS GULF COAST

FIRST REPORTS

Brazoria County—Glenn H. McCarthy's Carr 1, 363 ft fr n line and 600 ft fr e and w line of 40-ac tract, J. De J. Valderas sur, lcn. Rowan Drilling Co.'s Vilven 1, 466 ft fr w and n line of blk 7, sec 68 of J. S. Talmadge sur, lcn.

UTAH

FIRST REPORTS

Box Elder County—Northern Oil Co.'s Fee 1, cnw sw 17-13n-4w, White Valley area, rust.

WEST VIRGINIA

COMPLETIONS

Boone County — Owens-Libby-Owens' Bull Creek Coal & Land Co. 13, Peytonia district, top Corniferous 4478 ft, top Oriskany 4555 ft, top Newburg 5000 ft where 200,000 cubic feet of gas was gauged after shot, top Clinton 5872 ft with 215,000 cubic feet after shot, top Red Medina 5999 ft, td 6004 ft. First well in state to find gas in Newburg and Clinton sands.

WYOMING

FIRST REPORTS

Sublette County—J. C. Anderson Drilling Co.'s Marbleton Townsite 1, cw ne 30-30n-111w, Big Piney area, rust.

1939 Texas Petroleum Register now available

Texas Petroleum Register and Report Service, Inc. has announced the release of the 1939 Texas Petroleum Register. The roster contains a listing of some 10,000 companies and 20,000 individuals in the oil business in Texas and, in addition, listings of royalty companies, supply and equipment companies, service organizations, and allied industries. The catalog may be had for $10.00 from the compiler at P. O. Box 941, Austin, Texas. Copies are $7.50 each when purchased in lots of 5 or more.

Texas Mid-Continent meets at Houston in October

The twentieth annual meeting and convention of the Texas Mid-Continent Oil and Gas Association will be held at Houston October 5-6-7, 1939, with headquarters at the Rice Hotel. Program details will be announced at a later date.

Officers of the association are Chas. P. McGaha, president; George C. Gibbons, executive vice president, and Eugene McElvaney, treasurer.

Regional vice presidents are Al Buchanan, San Antonio; H. R. Cullen, Houston; John O'Donohoe, Wichita Falls; Lynn Boyd, Pampa; Harry Adams, Midland; Art Frazier, Abilene; Bryan Payne, Tyler, and J. L. Collins, Corsicana.

West Texas tanks sold for salvage

Midland, Texas.—Shrinkage of 1,265,000 barrels in the steel storage facilities in West Texas has resulted from the sale of Sinclair Prairie Oil Marketing Company's twenty-three 55,000-barrel steel tanks in the Church & Fields area, near the Crane-Upton County line, to the McCamey Pipe & Supply Company for salvage. These tanks were originally erected by Prairie Oil & Gas Company in 1928 to accomodate its surplus crude output before the advent of proration.

THE FORT WORTH LABORATORIES

Analysis of oil field brines, cores, gas, oil, and minerals. Field gas testing. R. H. Fash, Vice-President; Long Distance 138. 823½ Monroe Street, Fort Worth, Texas.

JACK A. SCHLEY

Patent Attorney

(Established 1902)

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San Antonio—Washington, D. C.

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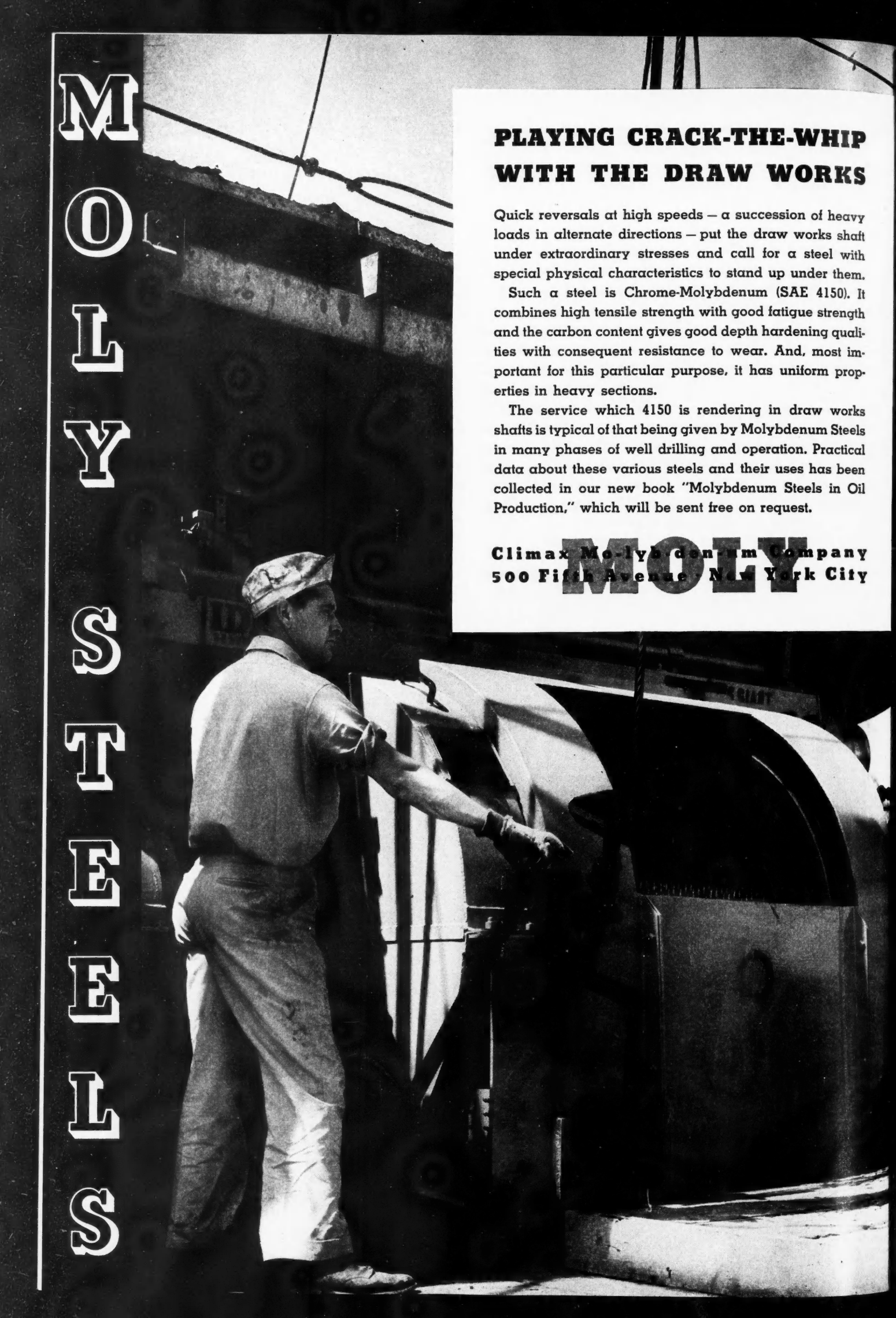


PLAYING CRACK-THE-WHIP WITH THE DRAW WORKS

Quick reversals at high speeds — a succession of heavy loads in alternate directions — put the draw works shaft under extraordinary stresses and call for a steel with special physical characteristics to stand up under them.

Such a steel is Chrome-Molybdenum (SAE 4150). It combines high tensile strength with good fatigue strength and the carbon content gives good depth hardening qualities with consequent resistance to wear. And, most important for this particular purpose, it has uniform properties in heavy sections.

The service which 4150 is rendering in draw works shafts is typical of that being given by Molybdenum Steels in many phases of well drilling and operation. Practical data about these various steels and their uses has been collected in our new book "Molybdenum Steels in Oil Production," which will be sent free on request.

Climax Molybdenum Company
500 Fifth Avenue, New York City

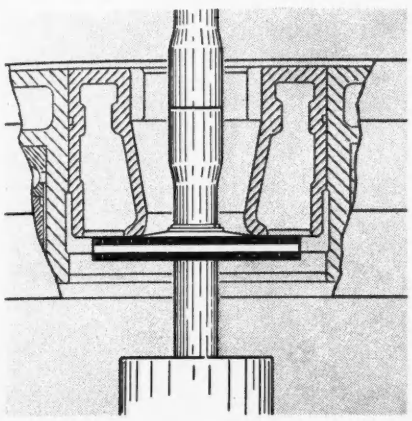
MOLY

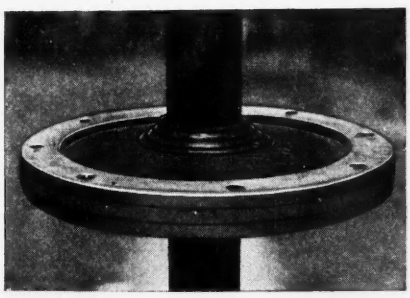
NOTES FOR THE Equipment Buyer and User

Pipe Wiper

MEDEARIS OILWELL SUPPLY COMPANY

Medearis Oilwell Supply Company, 8638 Otis Avenue, South Gate, California, offers a drill-pipe wiper that, according to the manufacturer, prevents the dilution of rotary mud and the necessity of reconditioning it on each round-trip. It is marketed under the trade name "Medearis Dri-Pipe Wiper."





Medearis Pipe Wiper

This drill-pipe wiper is designed with two rigid clamping rings of non-sparking metal which hold a circular red rubber wiping disc. This disk is molded of a specially compounded rubber, and has a control hole surrounded with concentric beads correctly spaced for the various sizes of pipe. As the central hole becomes enlarged through wear, the rubber can be cut away to the next bead to provide a new wiping surface for the next larger size of pipe. When the rubber disc is no longer serviceable it is discarded and a new one installed between the metal clamping rings.

Installation of the wiper is easy. After the kelly is removed, the wiper is slipped over the pipe and pushed down beneath the rotary. It then floats on the pipe between the master bushings and the well head. As the pipe is pulled through the rubber disc the wiper removes the fluid, which drops back into the casing. The flexible rubber disc passes over tool joints and protectors, wiping them also. It covers the well head completely and prevents objects from dropping into the hole.

This wiper, according to the manufacturer, cleans the pipe without the use of wash-water, and returns all of the mud and weight material to the hole. By preventing dilution of the drilling fluid, the wiper eliminates the necessity for reconditioning the mud on each round-trip, avoids the hazard of the fluid column being lightened to the blowout danger point, and facilitates study of the porosity and absorption characteristics of the formation. In addition, it is said, its use conserves water, and, by keeping the derrick floor dry and free of slippery mud, speeds operations and contributes to the safety of the workmen. The Dri-Pipe Wiper is also used to wipe tubing and sucker rods, special oil-resisting rubber wiping discs being furnished for this service.

Glyptal Gray

GENERAL ELECTRIC COMPANY

Glytal 1294 Gray, a recent addition to General Electric Company's line of welding accessories, was developed to meet the need of fabricators for a material which, when applied to metal to be lap welded, would prevent corrosion at the point where the plates overlap. It is a pigmented version of the previously announced Glytal 1294 Clear and will, like the latter, prevent the adhesion of weld spatter when applied to parts before welding. On lap welds it will prevent corrosion at the overlap. At the same time it serves as an excellent base for painting.

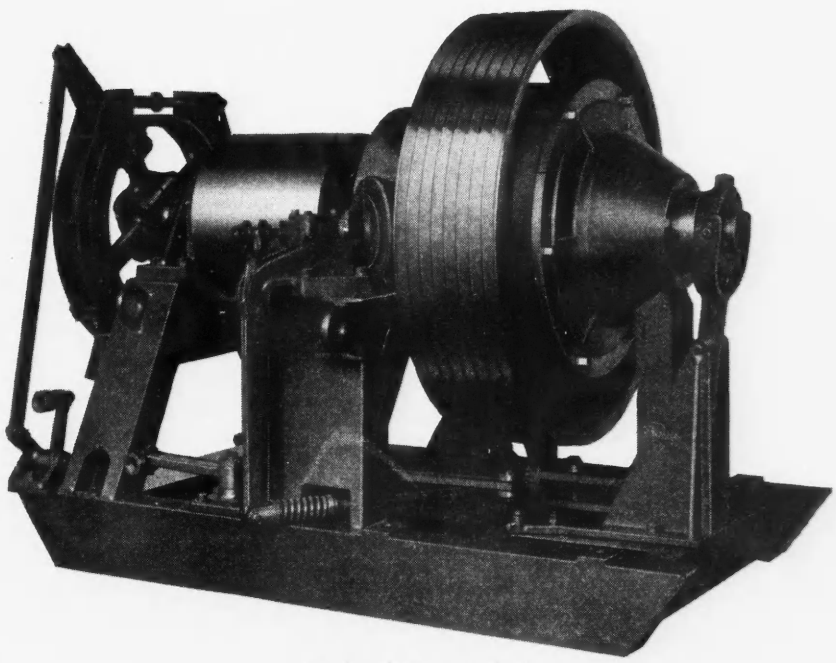
Glytal Gray can be sprayed or brushed and the work can be left exposed to the atmosphere until fabrication is complete with the assurance that edges of the parts will not need cleaning before the final welding operation. For this reason, it is expected that it will prove popular with pipe and tank manufacturers, and other fabricators of products which make use of lap-welded joints. Such fabricators can order their steel coated with Glytal Gray at the mill and can store it in exposed places until needed.

Unitized Countershafts

THE NATIONAL SUPPLY COMPANY

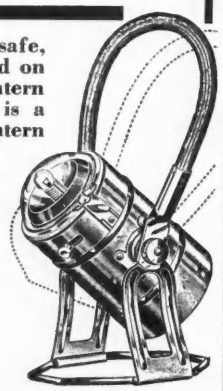
The new Superior Unitized Roller Bearing Countershaft, recently introduced by The National Supply Company, is for heavy pumping and for cable-tool drilling, with either horizontal or vertical engines. It can be furnished as No. 600 for straight pumping, without provision for well servicing; or as No. 601 when equipped with reverse mechanism to perform the functions of a reverse clutch. The clutch pulley is mounted on roller bearings and can be either 46-inch diameter x 16-inch crown face for flat belt, or grooved 45⅛-inch P.D. for 8-D section V-belts. The clutch pulley is overhung to facilitate installing endless flat belt or V-belts, for which the only preliminary is removing two pins from vertical clutch shifter lever and swinging the lever out of the way. Clutch is of the disc type, toggle actuated, with single point adjustment and extra large area of friction rings. The central friction ring is in halves to permit easy removal for relining when necessary. The 4½-inch diameter clutch shaft is carried by roller bearings.

The reversing mechanism consists of



National Countershaft

Here's a Pal Who Will Never Let You Down



When you need a safe, bright light, depend on Ecolite Electric Lantern No. 44 U.S.V. It is a sturdy, faithful lantern that always works. There's nothing to get out of order. Approved by Underwriters' Laboratories, too.

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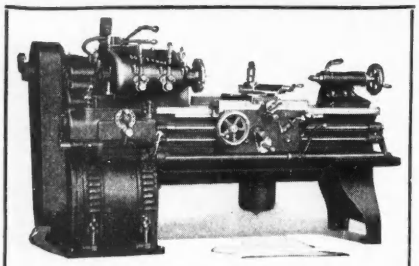

The Boye & Emmes Timken Bearing Engine Lathe

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Machine Tools—Metal Working Machinery—Bolt and Pipe Threading Machines—Electric Arc Spot and Butt Welders—Hand Power and Electric Traveling Cranes—Foundry and Forge Shop Equipment

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FOR SALE — Several Wilson Giant Drawworks, new and slightly used. Powered by International and Waukesha Motors. Earl H. Carter, Box 1227, Shreveport, Louisiana.

QUALIFIED PETROLEUM ENGINEER desires connection with oil company, tubular goods or equipment manufacturer. Ten years experience in Gulf Coast and Mid-Continent areas, expert knowledge of oil country tubular products and equipment, factory-mill and field training, sales experience, highest credentials, age 35. Box 42, The Oil Weekly, Houston, Texas.

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NOTES FOR THE Equipment Buyer and User

a steel beveled driving flange bolted to pads on arms of the main drive pulley or sheave; driven bevel reversing flange keyed to the main shaft, and two reverse friction cones of compressed laminated paper, fitted with roller bearings and revolving on short shafts carried by heavy slide blocks mounted on the steel frame support. The friction cones are engaged by vertical levers connected through rods to bell cranks linked to clutch shifter, so that operator at derrick has single-lever control of clutch and reverse mechanism. Speed in reverse is 70 percent faster than forward speed. The reversing mechanism can be attached in the field even when not ordered initially.

The extra heavy 18-inch crown face take-off pulley is of all split type for quick replacement when change in speed or pulley ratios is desired. Optional diameters are 20-, 22-, 24-, 25- and 29-inch. The extra heavy brake wheel is split to allow for expansion from heat without breakage. Brake shoes are all steel welded construction with extra heavy linings, easily renewable. Brake can be attached in the field if not initially furnished. The entire countershaft assembly is mounted on a heavy rigid welded structural steel frame, having oil field type skids, making a self-contained unit. Full details in National Descriptive Bulletin No. 223.

Link-Belt Completes General Catalog

Link-Belt Company, Chicago, announces the completion of its new 1278-page General Catalog No. 800, the largest and most comprehensive catalog it has ever issued, containing list prices, dimensions, weights, and engineering data on power transmission machinery, and on equipment for handling, screening, drying, cooling, preparing materials mechanically. A 44-page pictorial section in the forepart of the book is devoted to giving the recipient a bird's-eye view of the many products that the company makes.

Requests for this new book must be made on business letterhead and addressed to Link-Belt Company direct.

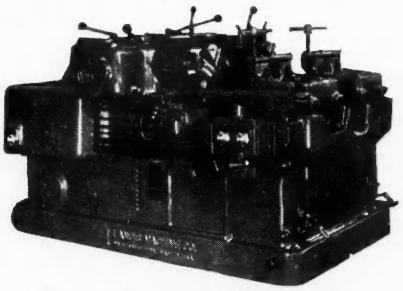
Lubricated Plug Valves

Merco Nordstrom Valve Company, 400 N. Lexington St., Pittsburgh, Pa., has published Bulletin V-129 which describes Merco valves with patented Sealdport lubrication for use with flexible couplings. They are manufactured with hub ends making it possible to connect to steel or cast iron pipe through the use of any standard, flexible coupling and where pipe vibration, contraction or expansion is a problem the flexible coupling valves should prove helpful. The bulletin presents detail drawings and photographs, along with dimensions, prices and all pertinent engineering information.

Improved Hydraulically Operated Machine

LANDIS MACHINE COMPANY

In June, 1937, Landis Machine Company, Waynesboro, Pa., announced its Lanhydro (Hydraulically Operated) Turning Machine. A number of important improvements which are worthy of discussion have been made recently to this machine.



Landis Improved Hydraulically Operated Machine.

The hydraulic cycle of the improved Lanhydro Turning Machine has been made more flexible to suit every kind of material and cutting condition, and the operation of the machine has been greatly simplified. The operating cycle is now controlled by a foot pedal which leaves the operator's hands free for loading and unloading the vises or work holding fixtures.

Now, as the cycle is completed, the work is removed from the vise or holding fixture and another piece is inserted but not clamped. The operator immediately depresses the foot pedal, shown in illustration, to start the cycle. The carriage then advances rapidly to a position where the work is about to enter the work center which is located within the bore of each turning head. This work center protrudes beyond the face of the turning head. At this point the forward movement of the carriage is checked to a very slow forward speed to permit the operator to guide the work into the work center after which he performs the final clamping operation.

The position at which the fast forward speed of the carriage is checked is made adjustable for jobs of different lengths. The slow forward movement for centering and clamping the work is also variable. After the work is clamped, the carriage again advances rapidly to the position where the work centers the turning head. A coarse feed is then used throughout for the turning operation. This coarse turning feed is made variable so that it can be adjusted to suit any material or turning speed.

If the work is of a nature that a shoulder must be faced, the cycle is so arranged that the carriage will advance under a fine finishing feed after it reaches a position within .008" or .010" of the shoulder. This fine finishing feed, like the slow turning feed, is also variable. The carriage advances under this fine finishing feed to a definite stop

NOTES FOR THE Equipment Buyer and User

and at that point a variable dwell period is provided for the final clean-up cut which makes it possible to hold the work to extremely close limits in length. After the dwell period, the turning head opens and the carriage returns rapidly to the starting position to complete the cycle. The turning head automatically closes as the carriage returns.

This improved hydraulic cycle greatly increases the flexibility of the Lanhydro Turning Machine and makes it applicable to a wider variety of turning operations in addition to simplifying its operation.

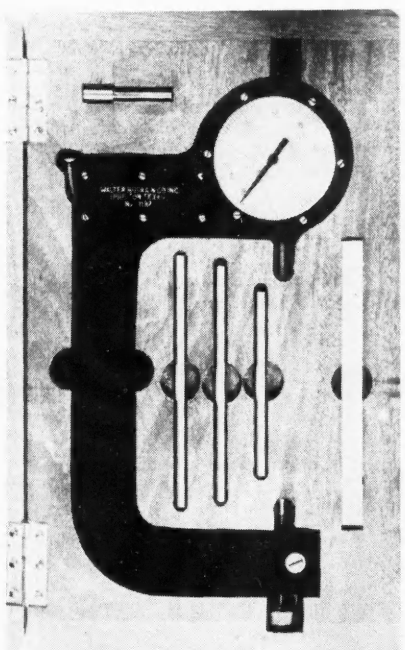
Tool Joint Wear Gauge

WALTER RUSKA & COMPANY

Walter Ruska & Company, 2332 Bellaire Boulevard, Houston, Texas has put on the market a Tool Joint Wear Gauge for measuring the wear on tool joints and pipe.

The gauge consists of a heavy aluminum U frame into which is built a rugged dial indicator with a range of .80 of an inch with hundredths inch subdivisions. The gauge reads tool joint wear direct. The measuring bar of the dial indicator is withdrawn by a lever when snapping the gauge around the joint to be measured. The measuring plunger and other steel parts are stainless. The dial indicator crystal is made of unbreakable material.

The gauge is supplied in a mahogany case with an assortment of three rods for setting the gauge to fit various tool joints. The gauge is made rugged to make it suitable for oil field service.



Ruska Wear Gauge

Cutting Torches

BASTIAN-BLESSING COMPANY

Bastian-Blessing Company, 242 East Ontario Street, Chicago, is marketing a new cutting torch that features stainless steel head and tubes, packingless valve, forged brass body, and solid-drawn copper tips. The "Rego KX" torch is available in 19- and 26-inch sizes, with 75° or 90° head angle. The "Rego KXX" torch, lower in price but identical in construction except for materials used in head and tubes, is also a recent development in the cutting-torch line.

Electric and Gas Generators for Double-Duty Welding

YOUNG SALES COMPANY

Young Sales Company, Milwaukee, has recently introduced a double-duty gas and electric welding unit which combines the P&H-Hansen 150 ampere portable welder manufactured by Harnischfeger Corporation of Milwaukee, and gas equipment manufactured and developed by Young Sales Company.

The electric welding unit consists of a P&H-Hansen 150 ampere generator coupled to a Wisconsin Air-Cooled motor mounted on the standard P&H Trailer. Used in connection with this unit is complete gas welding and cutting equipment. This is made up of nationally known make of welding and cutting torches, regulators and associated equipment. A 6-P sight feed acetylene generator is used to furnish acetylene while a special bracket is

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NO-SMOKE
STANDCO BRAKE LINING
Stands the gaff and gets the job done without scoring brake rims. See page 2100 Composite Catalog.
Standco Brake Lining Co.
HOUSTON

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CHEMICAL DRILLING MUD THINNER
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—QUICKLY DISSOLVED IN WATER
—READILY ADJUSTS THE VISCOSITY OF DRILLING MUD.
For information, communicate with the manufacturer, or consult your nearest supply company handling Lo-Vis Crystals.
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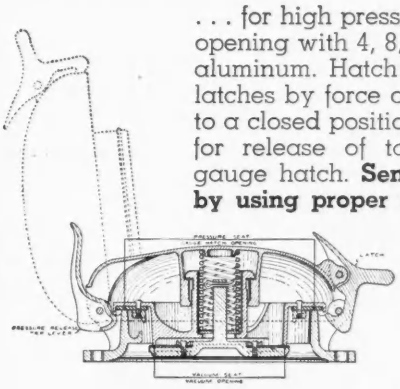
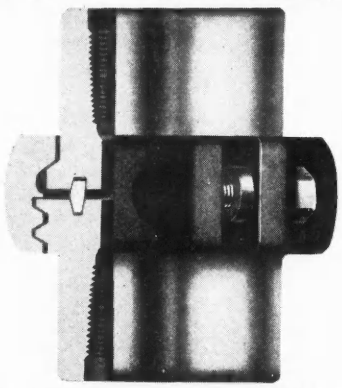
ENARDO Tank Equipment
LATCH TYPE V-P GAUGE HATCH
. . . for high pressure tanks. Available in 8" hatch opening with 4, 8, 12, 16, 24 and 32 oz. non-spark aluminum. Hatch easily opens and conveniently latches by force of its own weight when dropped to a closed position. Trip lever furnished provides for release of tank pressure without opening gauge hatch. Send for proof of savings effected by using proper tank equipment.

Specify 1. lb. pressure equipment on welded tanks—which means ENARDO No. 660—a valve which will hold the pressure.
Enardo Equipment conserves enough of the rich vapors to pay for itself in a short time.
ENARDO FDY. & MFG. CO., 2729 Sand Springs Road, Tulsa, Okla.
"There Is an Enardo Valve for Every Tank Requirement"

Red-Rex

QUICK-JOINT

PIPE UNIONS



High Pressure Steel Unions—3,000 lbs. and 6,000 lbs. test. Renewable seal ring with three tapered sides gives leak-proof joint. One straight side secures seal ring in one hub. Scientifically designed threads allow for contraction and expansion; equalize pressure at all points; line up off-center hubs.

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Stock sizes include 60, 100, 150 and 200-map capacity cabinets in both walnut and oak finish. Cabinets made to fit your specification on short notice.

PORT CITY CABINET WORKS

HOUSTON, TEXAS

609-13 Quitman St. Phone Pres. 0725

NOTES FOR THE Equipment Buyer and User

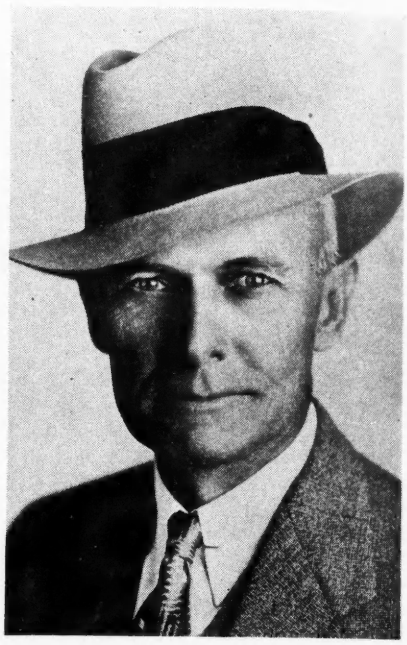
so arranged to carry either a large or small tank of oxygen.

This combination unit is adaptable for all ordinary work and offers the welder the utmost in economy. Its extreme portability is very desirable. In view of the fact that the equipment which comprises this entire unit is manufactured by concerns which are outstanding in their particular fields, this should be a very attractive unit to those who are interested in portable equipment. Further information about this unit may be obtained by writing either Harnischfeger Corporation or Young Sales Company, both of which are at Milwaukee.

El Paso Office Change Announced by Allis-Chalmers

With the recent retirement of J. B. Cooper, manager of Allis-Chalmers Manufacturing Company's district office at Phoenix, Arizona, the company's former Phoenix office and its El Paso, Texas, branch office will be combined into one district to be known as the El Paso District. O. F. Metz, former branch manager of El Paso only, has been made district manager of the combined new territory with offices at El Paso. H. H. Roth of Phoenix has been transferred to El Paso. Henry W. Erickson, recently transferred engineer from Allis-Chalmers Crushing, Cement and Mining Division at Milwaukee, Wisconsin, will remain in the combined El Paso territory as a representative specializing in mining machinery built by the company.

O. F. Metz has been a sales engineer there for Allis-Chalmers Manufacturing Company since 1913. After graduating in electrical engineering from Ohio State University in 1905 he joined the Bullock Works of the company in Cincinnati where all the company's electrical equipment was built at that time. Later, in the erecting division, his field experience included complete steam and hydro-electric power plant equipment and the installation of many other types of power and industrial machinery. Prior to going to the El Paso district office, he had also spent some time at the company's San Francisco office.



O. F. METZ
District Representative, Allis-Chalmers Manufacturing Company at El Paso.

J. B. Cooper, who has retired from the Phoenix, Arizona, district office, after over 30 years of service with the company, will live the life of a gentleman farmer on his Avocado Ranch at Vista, California, which is located near Oceanside, about 20 miles north of San Diego.

Simplified service adjustments of bearings is provided at this Goulds plant in all vertical and horizontal triplex pumps by incorporating laminated shims in the bearing assemblies. Paper-thin brass laminations are simply peeled off the "solid" shim to compensate for bearing wear.

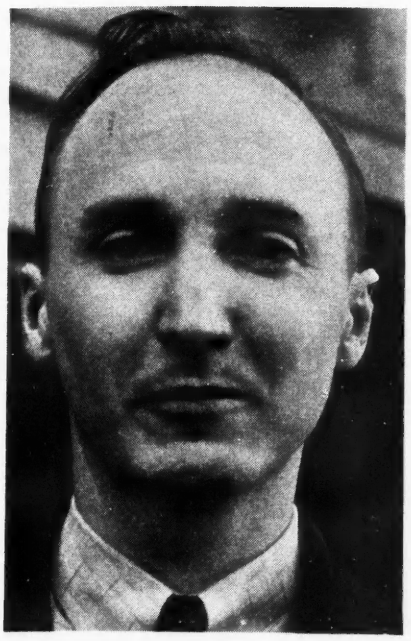
Dave Calhoun New Manager Pedrick Industrial Division

Appointment of David R. Calhoun as manager of its industrial division is announced by Wilkening Manufacturing Company, Philadelphia, maker of Pedrick Heat-Shaped piston rings.

Calhoun has been in the Pedrick engineering department for several years. During the past two years he has been responsible particularly for service engineering in connection with field sales and has traveled extensively. He received his engineering degree from Drexel Institute of Technology in 1934, and joined the Wilkening organization after a brief experience with Philco Radio & Television Company.

Announcement is made also by Wilkening Manufacturing Company of the

NOTES FOR THE Equipment Buyer and User



DAVID R. CALHOUN
Manager, Industrial Division, Wilkening Manufacturing Company

promotion of Webb Pedrick to the position in the engineering department made vacant by the above promotion of Dave Calhoun. After several years experience with Pedrick Machine and Tool Company of Philadelphia, Webb Pedrick joined the Wilkening organization in 1936 and has been engaged since then in the experimental and research division of the engineering department. He is a grandson of Howard Pedrick, the inventor of the Pedrick Heat-Shaped process of piston ring manufacture.

McCullough Tool Company Has New Houston Headquarters

Future Texas Gulf Coast operations of McCullough Tool Company will be directed from a new Houston plant at 405 McCarty Road. The building is an 80 x 100 foot all-steel structure of the movable type and is so designed that additions are easily made. It is located on a 3½-acre plot.

In this building the company will garage its mobile gun perforator units and service trucks and maintain its line of fishing tools. Also housed in the building is a machine shop for instrument and tool repair.

Quaker City Rubber Company Opens Branch Office at Houston

Announcement has just been made by Quaker City Rubber Company, of Philadelphia, of a new branch at Houston, in charge of H. M. Sossaman, located at 201 San Jacinto Street, where it will carry a substantial warehouse stock of belting, hose, packing and miscellaneous rubber goods.

The Houston branch will serve Arkansas, Louisiana, Mississippi, New Mexico, Oklahoma and Texas.

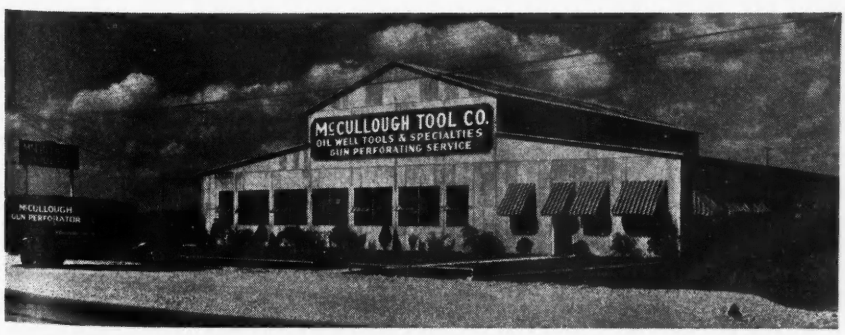
Leeds Becomes Board Chairman of Leeds & Northrup

Morris E. Leeds, founder and president of Leeds & Northrup Company, is assuming the position of chairman of the board of directors, and Charles S. Redding, vice president in charge of research and engineering, becomes president, in an expansion of the company's executive set-up effective July 10. Chairman of the board is a post newly created.

Redding took his first position with Morris E. Leeds & Company, predecessor of the present firm, for 15 months between high school and college. Receiving a B.S. in E.E. from the University of Pennsylvania in 1906, he spent 2 years as instructor in mechanical engineering there, and was briefly associated with the Engineers Club of Philadelphia. He rejoined the company in 1909, by which time it had become Leeds & Northrup Company, and has since held executive positions in every division of its activities. He became second vice president in 1918, was treasurer from 1922 to 1924, and became vice president in charge of research and engineering in 1928.

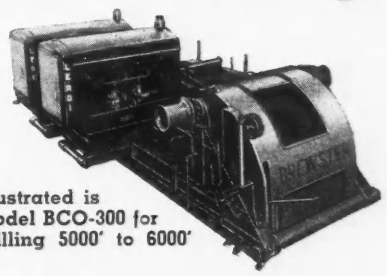
Leeds started his own business in 1899, providing an American source of "null" or balance-type electrical measuring instruments — resistors, condensers, galvanometers, inductors, etc.

He then proceeded to the pioneering



McCullough Tool Company recently moved into this new plant at Houston

BREWSTER Portable Rigs



Illustrated is Model BCO-300 for drilling 5000' to 6000'

In the Brewster line of portable rigs you will find complete units for drilling up to 6000'. The smaller units using one motor. The larger units two compounded motors. Mid-ship oil-bath chain transmissions are employed to give additional speeds and make the units more compact and economical in operation.

Brewster also makes companion roller bearing Crown and Traveling Blocks and Oil-Bath Rotaries to match any rig.

The BREWSTER CO., Inc.
Phone 2-3181 **Shreveport, La.**
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Let Dragons Prove They're *"Different"*

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"On Duty or in Competition—as Fearless as the Dragon"

The Dragon Mfg. Co.
Marietta, Ohio

NOBS COMPOSITION CUPS

CHOICE OF ROOMS
With or Without AIR CONDITIONING

Other features include: Central location, garage and parking lot adjoining, popular priced Coffee Shop, all rooms with circulating ice water. Rates: $2.00, $2.50, $3.00.
J. S. MICKELSON, Manager

SAM HOUSTON
HOUSTON • TEXAS

NOTES FOR THE Equipment Buyer and User

development of the automatically-operated balance-type instrument which would not only measure, but would also record, signal and control. Some years later, in 1920, he was awarded the Edward Longstreth Medal of Merit of the Franklin Institute for this invention. The recorder was the forerunner of the present Micromax machine, used for recording and controlling a wide variety of conditions which range from temperature to frequency, chemical strength, and many others.

Paralleling this development of products, manufacturing methods and markets was the development of policies and methods to apply Leeds' philosophy of business and social justice within his organization. The successful working out of these plans was evidenced by the presentation to him in 1931 of the Forbes Award for the best employer-employee plan actually in operation. In that same year the University of Pennsylvania Press published "Wages; A Means of Testing Their Adequacy," a monograph by Leeds and Prof. C. C. Balderston, in which they made a case study of wages and living expenses of Leeds & Northrup personnel.

The Institute of Management, in 1936, awarded its Gantt Medal to Leeds, citing him for "distinguished achievement in industrial management as a service to the community."

"Toward Full Employment," a book published in 1938, is a critical study of useful employment, financial stability and our tax system. Written by Leeds, Henry S. Dennison of the Dennison Manufacturing Company, Lincoln Filene of William Filene's Sons Company, and Ralph E. Flanders of Jones & Lamson Machine Company, it brings up to date the ideas and recommendaof four executives who have had lifelong practical experience with the problems they discuss.

Leeds has always been active in educational affairs. A graduate of Haverford College with the degree of B.S. in 1888, he taught at Westtown Boarding School for 2 years before entering business. He is a trustee of Germantown Friends School and of Christiansburg Industrial Institute, and is president of the Corporation and Board of Managers of Haverford College. Brooklyn Polytechnic Institute gave him the honorary degree of Doctor of Engineering in 1936. His most recent responsibility in education came in 1939, when he was elected president of the Board of Education of Philadelphia.

International Harvester Sending Representative to Singapore

L. E. Salom will sail from San Francisco July 8 for Singapore, where he will represent the International Harvester Export Company in the Far East with headquarters at Singapore.

Manganese Steel

American Manganese Steel Division of American Brake Shoe & Foundry Company, Chicago Heights, Illinois, has prepared Catalog 59 in pictorial explanation of the industrial applications of manganese steel castings. Views of plant facilities and processes precede a profusion of illustrations upon the manner in which manganese steel have been applied to the equipment problems of industry.

THE COMPOSITE CATALOG, Houston, Texas, U. S. A.
We have used the Company's Catalog filed in The Composite Catalog and would appreciate your asking the manufacturer to send us immediately:
More data on (Name Product Here)
Prices on (Name Product Here)
Firm
Address
By
Title
Date
PC-39

A double supply of these blue cards will be found in the index of the 1939 Composite Catalog.

FOR YOUR
Convenience

Because The Composite Catalog contains the complete or condensed catalogs of over 400 leading manufacturers you will usually be able to find—immediately—what you need, but for those cases where you fail to find *all* the data you need just fill out one of these cards and drop it in the mail. No postage required in the U.S.A. The data requested will be sent promptly.

THE COMPOSITE CATALOG
OF OIL FIELD AND PIPE LINE EQUIPMENT

Squeaks from the Bull Wheel

Self-Evident Error

"Will you correct this sentence, 'Girls is naturally better looking than boys.'"

"Girls is artificially better looking than boys."

Making It Easy

Librarian: "This is our time for closing. Is there anything you would like to take out?"

Student: "Why, yes, how about your assistant over there, that blonde in the blue dress?"

Fair Guess

"If you had a little more spunk you would stand better in your class. Now, do you know what spunk is?"

"Yes'm. It's the past participle of spank."

He Should Know

"Have you been to any other doctor before you came to me?"

"No, sir. I went to a druggist."

"You went to a druggist? That shows how much sense some people have. You went to a druggist. And what idiotic advice did the druggist give you?"

"He told me to come and see you."

Sure Had a Lot of Chique

There was once a man not unique,
Who imagined himself quite a shique,
But the girls didn't fall
For the fellow at all,
For he made only twenty a wique.

Obliging

"You don't smoke cigarettes, do you, little boy?"

"No, ma'am, but I can let you have a chaw of terbacer."

Helpful Gesture, Anyway

Pop, I wish you would help me with this problem.

Can't, son. It wouldn't be right.

Maybe not; but you could try.

"Well, Say It Quick"

An angler who had been trying to hook something for the last few hours was sitting gloomily at his task when a mother and her small son came along.

"Oh," cried the boy, "Let me see you catch a fish!"

Addressing the angler, the mother said severely, "Now, don't catch a fish for him until he says 'Please'!"

Proof of the Pudding

A ship called at a Cannibal Isle and was surprised to see the missionary come out in a canoe.

"How on earth did you ever keep them from eating you?"

"It was easy. You see, I have a cork leg. As soon as I landed, I pulled up my trousers, cut off a slice and handed it to the chief. He decided I wasn't worth cooking."

But Thanks Anyway

A certain railroad vice president alighting from his special car at a small terminal and having nothing else to do, engaged in conversation with the first employe he met. The latter happened to be an elderly man in overalls.

"How long have you worked for this road?" the official inquired.

"Forty-two years," was the reply.

"How much do you make?"

"Forty cents an hour."

"And how much did you make when you first came to work for us?"

"Forty cents an hour."

The vice president marveled. Indeed, the incident so preyed on him that at the next board meeting he suggested something be done for the employee who had labored 42 years at 40 cents an hour. "We'll retire him," said the chairman. So the employe was honored by being invited to appear before the board. He received a substantial check and, while fingering it uncertainly, the president sought to relieve him by asking:

"By the way, what is your job with our line?"

"I go around the yard hitting the wheels with a hammer."

"And what did you do that for?" asked the president beamingly.

"I'm sure I don't know."

Is Uncle Jim an Elk?

"Every one in our family is some kind of animal," said Jimmie to the amazed preacher.

"Why, you shouldn't say that!" the good man said.

"Well," said Jimmie, "mother's a dear, the baby is mother's little lamb, I'm the kid and dad's the goat."

What Did She Mean?

When we reach the third lamp post from here I'm going to kiss you.

Oh, William, isn't that going too far?

A Cheap Alternative

MacPherson was in love, and after he and his girl had a walk one evening he invited her to have a drink, feeling sure she would ask for nothing more than a modest lemonade.

"Well, Jennie, dear" he said, "and what'll I order for ye?"

"Why, thank you," she replied. "I'll have a large port."

"A large port!" he gasped. "Gosh, woman, come on oot and I'll buy ye a picture postcard o' Liverpool Harbor."

Wasted Compliment

"Dat no'count Mose told me last night ah looked positively ethereal in de moonlight."

"Whut do he mean?"

"Ah dunno, but I done slapped his face so as to be on the safe side."

Best in Her Line

"Wuz dat yo' bes' girl fren'?"

"Oh, no; jes necks bes'."

At Long Last

"You called me up the other day and told me to redecorate your guest room."

"It isn't necessary now. My guest has gone home."

Double Chance

"I see this medicine is advertised as good for man or beast."

"Yes."

"Gimme a bottle. Maybe that's just the right combination to cure my husband."

Honeymoon's Over

"Now that we are married, perhaps I can point out a few of your defects."

"Don't bother, dear, I know all about them. It's those defects that kept me from getting a better man than you."

Gott
WATER CAN
Gotkool
WATER CANS
& COOLERS
GOTT Water Cans are the practical way to keep drinking water cool for long periods, protected from impurities and always handy to the job. Snug fitting large removable top, strongly built to withstand rough usage. GOTT Water Coolers have extra large covers and a handy non-leaking push button faucet. Your Supply Store has them, get one today! . . . . . .
GOTT WATER CAN
Made in 1½, 3, 5, and 10 gallon sizes.
GOTT WATER COOLER
Made in 3, 5, 8, 12, and 20 gallon sizes.
H. P. GOTT MFG. CO.
WINFIELD, KANSAS
KEEP PURE DRINKING WATER ALWAYS HANDY

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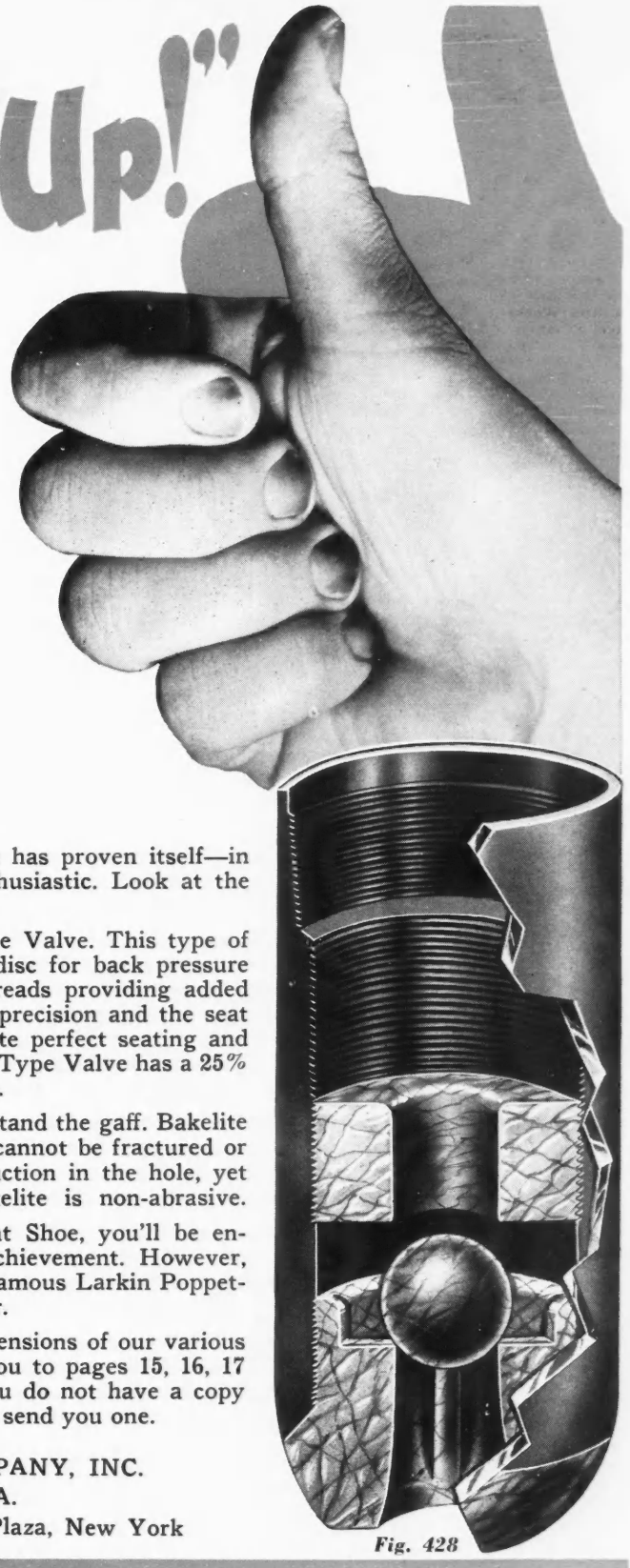
Operators say, "Thumbs Up!"

The LARKIN Ball Type Float Shoe IS RIGHT!



THE new Larkin Ball Type Float Shoe has proven itself—in a big way. Operators everywhere are enthusiastic. Look at the illustration of it, and you will see why.

Note the construction of the All-Bakelite Valve. This type of shoe employs the use of a solid bakelite disc for back pressure resistance, threaded into the shoe, the threads providing added safety. The ball is ground to ball bearing precision and the seat is machined and lapped, assuring immediate perfect seating and shut-off at any time. Furthermore, the Ball Type Valve has a 25% greater opening entirely through the shoe.

The Bakelite, shock-resistant Guide can stand the gaff. Bakelite Guides are so tough and strong that they cannot be fractured or broken by collision or contact with obstruction in the hole, yet they are easier to drill up because Bakelite is non-abrasive.

If you prefer the Ball Type Float Shoe, you'll be enthusiastic about this new Larkin achievement. However, keep in mind that we still make the famous Larkin Poppet-Type Valve—just as popular as ever.

For charts showing the actual dimensions of our various types of float equipment, we refer you to pages 15, 16, 17 and 18 of our Bulletin No. 26. If you do not have a copy of this bulletin we shall be pleased to send you one.

LARKIN PACKER COMPANY, INC.
St. Louis, U. S. A.
Export Office, 30 Rockefeller Plaza, New York

Fig. 428

LARKIN PACKER CO.

Use AMERICAN LONG DRILL COLLARS *and help* ELIMINATE CROOKED HOLES

This ad appeared for the first time 5 years ago. Hundreds of operators since have taken this suggestion and, as the result, they have consistently drilled straighter hole in less time, at less cost. And again, we suggest, "Use American Long Drill Collars and eliminate crooked holes."

FEW OF MANY AMERICAN PRODUCTS

Releasing and Circulating Overshots	Releasing and Circulating Spears
Wall Hooks	Tapered Taps
Milling Shoes	Automatic Catheads

AMERICAN LONG DRILL COLLAR

American Iron & Machine Works Co. pioneered the long drill collar and has been instrumental in its development and high efficiency such as offered today. When you buy an American Drill Collar, you know it's the best.

AMERICAN IRON & MACHINE WORKS CO.

Oklahoma City, Okla.; Houston, Texas, Corpus Christi and Monahans, Texas; Harvey and New Iberia, Louisiana; Great Bend, Kansas

EXPORT OFFICE: 420 LEXINGTON AVE., NEW YORK CITY

California Representative: Hopper Machine Works, Inc., Bakersfield, California.

Engineered for long-dependable service

REED ROCK BITS

One of Man's Great Achievements

REED ROLLER BIT CO.

PICK A WINNER

WHEN THE GOING'S TOUGH, QUALITY SURE DOES TELL

TWO PORTLAND CEMENTS—BOTH MADE FOR OIL WELLS

USE 'STARCOR'—for deep wells, high temperatures, extra sulphate resistance.

USE 'INCOR'—for wells of moderate depth, and low temperatures.

WHEN a race is close, the camera is often needed to decide the winner. Not so with 'Starcor'—always well out in front at the finish. Ancestry . . . performance record . . . that's the best way to pick a winner, in horses or cement.

Take those close-shave workover jobs, for example . . . ticklish business, so the cement has to be right, For one thing, the cement is in direct contact with the drilling fluid; that calls for heavy slurries that minimize contamination, yet pump easily so as to penetrate the formation thoroughly and uniformly.

The cement also has to be slow-setting, to allow plenty of time to complete the job; yet, once in place, it has to gain strength rapidly, in order to offset agitation.

These are some of the qualities "bred" into 'Starcor'—part of the reason why 'Starcor' is the right cement to use for squeeze jobs.

Pick a winner: Use 'Starcor'* also for deep wells, high temperatures, extra sulphate resistance . . . 'Incor'* in wells of moderate depth . . . Lone Star for work above-ground. Portland cements, all—each the quality standard in its own field.

*Reg. U. S. Pat. Off.

LONE STAR CEMENT CORPORATION

MAKERS OF LONE STAR CEMENT • 'INCOR' 24-HOUR CEMENT • 'STARCOR' CEMENT

Price Reductions

A PROMISE MADE—A PROMISE KEPT!

★ During the early years of our company's existence we promised we would reduce prices in ratio to cost reductions made possible from increased volume. This promise has been consistently kept in the past and will be kept through future years. The increased volume we receive is sure to reduce the price of your future purchases.

★ During the past three years many manufacturers have been forced to advance prices because of increased costs resulting from social security, old age pensions, unemployment insurance and a greatly increased tax burden. We not only have met these increased costs but have added hundreds of valuable improvements—improvements which have more than doubled the life and usefulness of our drilling, servicing and pipe-line units.

★ Our sales for the first five months of 1939 were $207,000.00 more than for the same period of 1938, which, with new shop production equipment of the latest type, make large reductions possible.

★ These reductions range from a few dollars to $1,200.00 per unit. Write for new prices and complete specifications.

LIGHTER RIGS SAVE HAULING COSTS

•

DRAW WORKS AND ENGINE ON ONE SKID —SAVES RIG-UP TIME

RDWELL MFG. CO. INC.

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1001 - Cable Addresses: "ALLSTEEL", WICHITA - "CARDSTEEL", NEW YORK

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HOWARD SUPPLY CO.
California Representative
5125 Santa Fe Avenue
Los Angeles, California

NATIONAL BANK OF TULSA

TULSA, OKLAHOMA

STATEMENT OF CONDITION JUNE 30, 1939

RESOURCES

Cash and Due from Banks	$32,973,669.26	
U. S. Government Securities	13,536,845.97	
Other Bonds and Warrants	6,044,520.03	$52,555,035.26
Loans and Discounts		16,186,327.84
Overdrafts		808.43
Income Receivable Accrued		129,950.37
Stock in Federal Reserve Bank		180,000.00
Bank Premises		3,142,500.00*
Customers' Liability under Acceptances		10,702.50
TOTAL		$72,205,324.40

LIABILITIES

Deposits		$65,568,867.71
Acceptances Executed		10,702.50
Income Collected not Earned		63,637.04
Reserve for Interest, Taxes, etc.		38,524.15
Reserve for Preferred Dividends		15,000.00
Capital—Preferred	$1,000,000.00	
Capital—Common	2,500,000.00	
Surplus	2,500,000.00	
Undivided Profits and Reserves	508,593.00	6,508,593.00
TOTAL		$72,205,324.40

* Increase of $257,023.48 in Book Value of Bank Premises since previous report, is due to payment in full of $560,000 mortgage indebtedness.

The Oil Bank of America

Member Federal Deposit Insurance Corporation

PHILADELPHIA'S CAPITOL

socially, commercially, politically, is the Bellevue. Here vital things happen, outstanding events are held—and important people stay. Reasonable rates.

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BELLEVUE-STRATFORD

IN PHILADELPHIA

Claude H. Bennett, *Gen. Mgr.*

LOOKING AHEAD

WITH THE EDITOR

The Trend Toward Deeper Drilling

IT doesn't make any difference if certain operators are pretty well fed up on the hazards and expense incurred in developing deep production and are showing an inclination to be tempted only by those leases having shallow possibilities, the trend distinctly is toward deeper drilling.

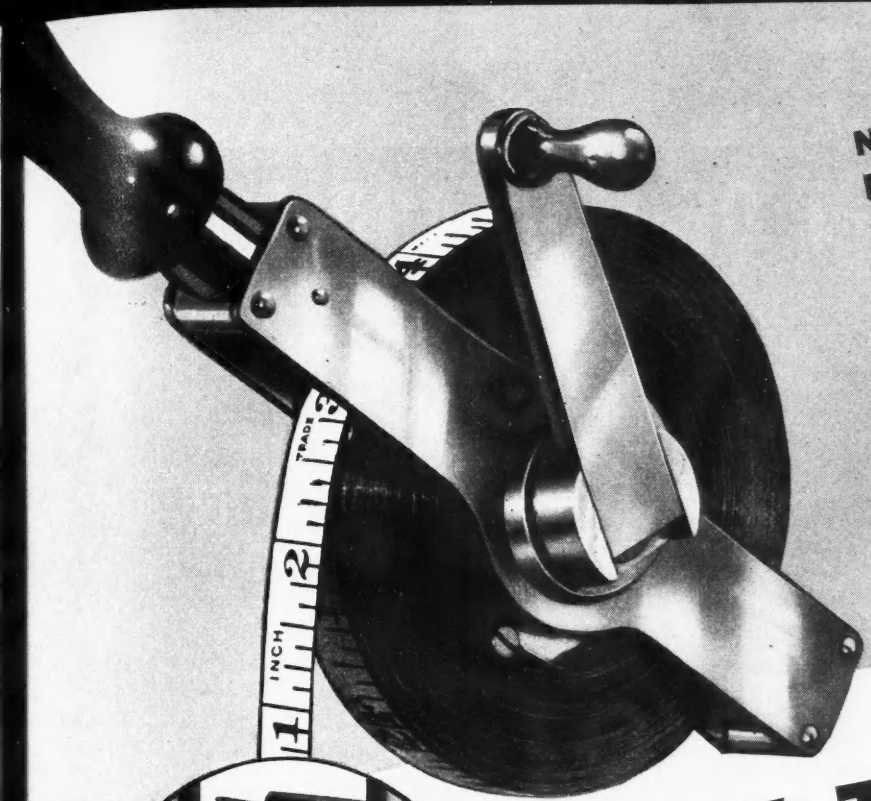
The figures on deep strikes are emphatic: 27 fields have been found productive below 10,000 feet. Of these, 8 were found in 1937, 12 in 1938, and 1939 has started off with 7 of them in 6 months. More indicative of the trend, perhaps, are the figures on deep completions. Of the 311 drilled since the first in May, 1931, more than 80 percent of these 10,000-plus-foot jobs were completed in the past 18 months.

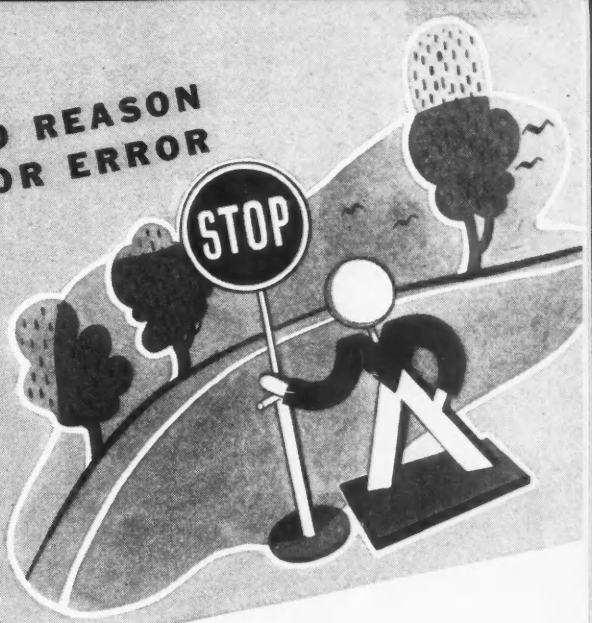
The actual scientific value of drilling to 10,000 or 15,000 feet is to the oil industry's technique what the Indianapolis speedway contest claims to be to the automobile manufacturer. Rare is the deep well drilled to completion that does not expose some kink that should be worked out of technique, and sometimes the technologists can pass the buck for responsibility of the kink to equipment, a situation which eventually is solved to the mutual benefit of manufacturer and user.

Advances in equipment design and performance, advances in handling pressure, in developing gas-distillate areas found at greater depths, effect on speed of the rotary table, and a host of other subjects having a direct bearing on deeper drilling will be handled in the July 31 issue of THE OIL WEEKLY.

Be on the lookout for this special deep well number.

The OIL WEEKLY, Published every Monday. Entered as second-class mail matter December 23, 1916, at the post office at Houston, Texas, under act of March 3, 1879.





EASY TO READ!

...and the raised graduations resist abrasion

HERE is the latest addition to the famous Wyteface family—a gauging tape with *raised* black metal graduations, numbers and edges! You'll find it ideal for gauging crude, where wear against the hatch, sandy residues and constant wiping shorten the life of an ordinary line.

Dallas Wyteface "A" has all the well known Wyteface advantages. The crackproof white surface contrasts sharply with crude oil to give you a well defined level mark. The black-on-white graduations are easy to read, even in dim light. This extra visibility is a great convenience in the field, and a valuable safeguard against costly errors.

Ask your Oil Well Supply Dealer to show you Dallas Wyteface "A", designed specially for gauging crude. There are other Wyteface Tapes for every Oil Field requirement. A complete catalog will be sent upon request.

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n. wide, 50-ft. long,
a sturdy stainless
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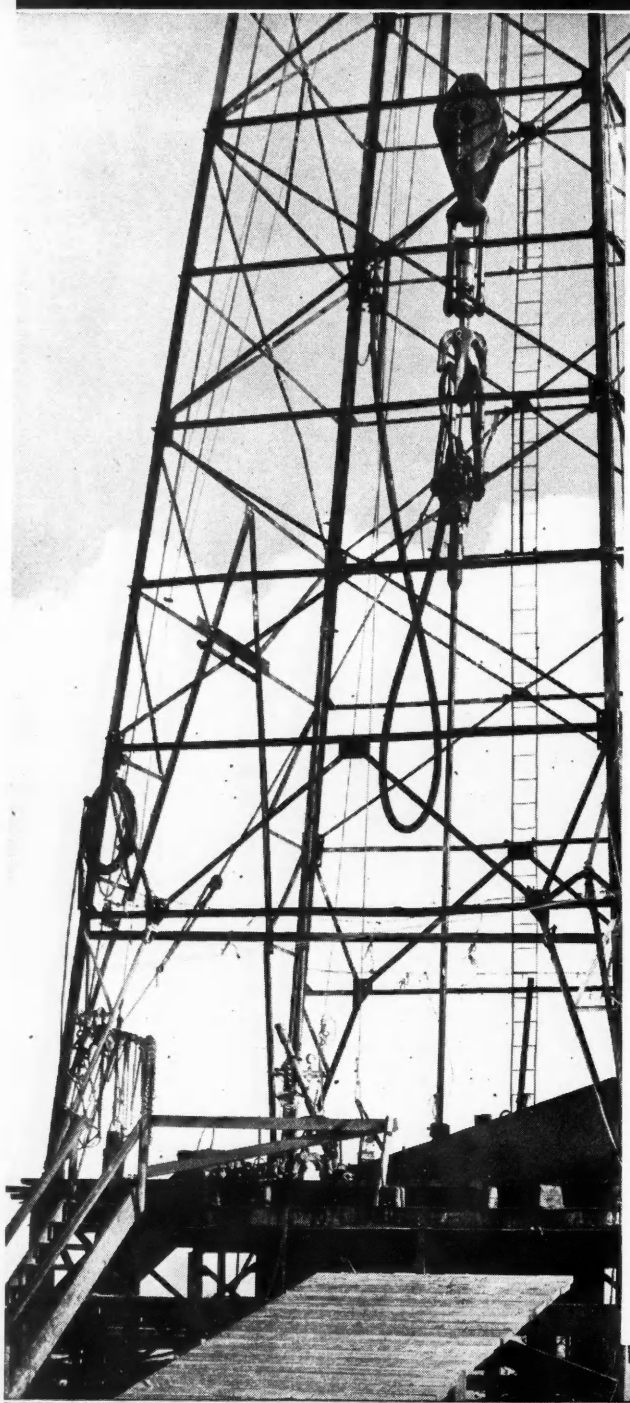
K&E WYTEFACE "A" TRADE MARK STEEL TAPES

RAISED BLACK METAL GRADUATIONS ON A CRACK-PROOF WHITE SURFACE!

A STEADY DIET OF MUD AND OIL...



yet this

Thermoid Rotary Hose

drilled 12 wells

Operated by Mr. W. J. Walsh, this rig, equipped with a 2½" x 45' Thermoid Rotary Hose, drilled 12 wells to a 3,000 foot depth in the Kermit, West Texas, area. In addition to handling mud fluid for the regular drilling operations, this same Thermoid Hose was used for drilling in with oil on all twelve locations.

Mr. Walsh's experience is particularly significant when it is realized that ordinary hose has frequently given only one or two well service under the same operating conditions.

This report adds to the ever-growing tide of evidence that Thermoid Rotary Hose has the built-in strength for outstanding oil field service. In all fields Thermoid Hose has proved that it can withstand terrific punishment, and still turn in exceptional service records.

If you are planning new equipment—or replacements—be sure you specify Thermoid. You'll find that it pays.

· ROTARY HOSE ·
AIR · STEAM · WELDING
REFINERY HOSE
· PACKINGS ·
FLAT AND V BELTS
BRAKE LININGS
AND BRAKE BLOCKS

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DISTRIBUTED IN ALL OIL FIELDS BY
OIL WELL SUPPLY COMPANY

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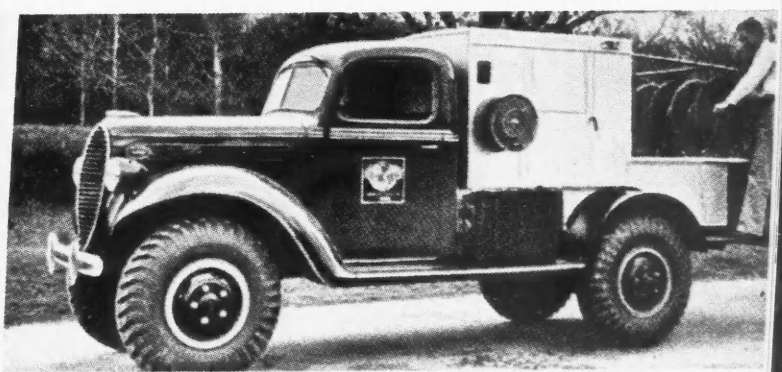
Proved in the Oilfields as everywhere else...

Many Times, Well Locations are in out-of-the-way places, with practically no roads to them," reports M. W. Gibson of the Gibson Oil Well Cementing Company. "We find that Ford V-8 and equipment will go in and do the job where heavier trucks fail."

You'll haul better and at lower cost with Ford V-8 equipment on the job!

TEST a Ford V-8 truck on your kind of hauling—and you'll find, as have these five oilmen and as truck operators everywhere are finding, that Ford V-8 power, stamina, economy means more work in less time at less cost all along the line! Arrange an "on-the-job" test of Ford V-8 equipment now—and don't buy any new equipment until you do!

perating a Fleet of 20 Ford V-8 Trucks in three East Texas plants, S. V. Evans, Trux-Mix Concrete Company superintendent reports, "After using other makes, our records show costs are lower with Ford trucks than with any other make."



Geophysical Service of Dallas has been using Ford V-8 trucks for eight years. "We have found," reports J. E. Jonson, "that Ford makes the only units that will stand the grueling strains to which we subject them!"

. E. Thomas of Henderson, Texas, purchased this Ford V-8 truck in 1937. It has been driven 80,000 miles, and only $20 has been spent for repairs. "The most economical and satisfactory truck I have ever owned," he reports.

33,687 Miles . . . 1 2/10¢ Per Mile is the remarkable record of this 95 h.p. Ford V-8 Cab-Over-Engine truck as reported by Earl C. Gibbon, Henderson, Texas, who operates five of these Ford V-8 units hauling heavy butane tanks in East Texas and Louisiana oilfields.

FORD V-8 TRUCKS

60, 85, 95 H.P.
SIX WHEELBASES
45 BODY TYPES

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From the charging of the blast furnace with specially selected ore, to the last inspector's stamp of approval the making of Youngstown Seamless Tubular Goods is under constant, scientific laboratory control. We know how important strength, uniform wall thickness, accurate threads are to you. You can count on these qualities in every length of pipe that bears our name.

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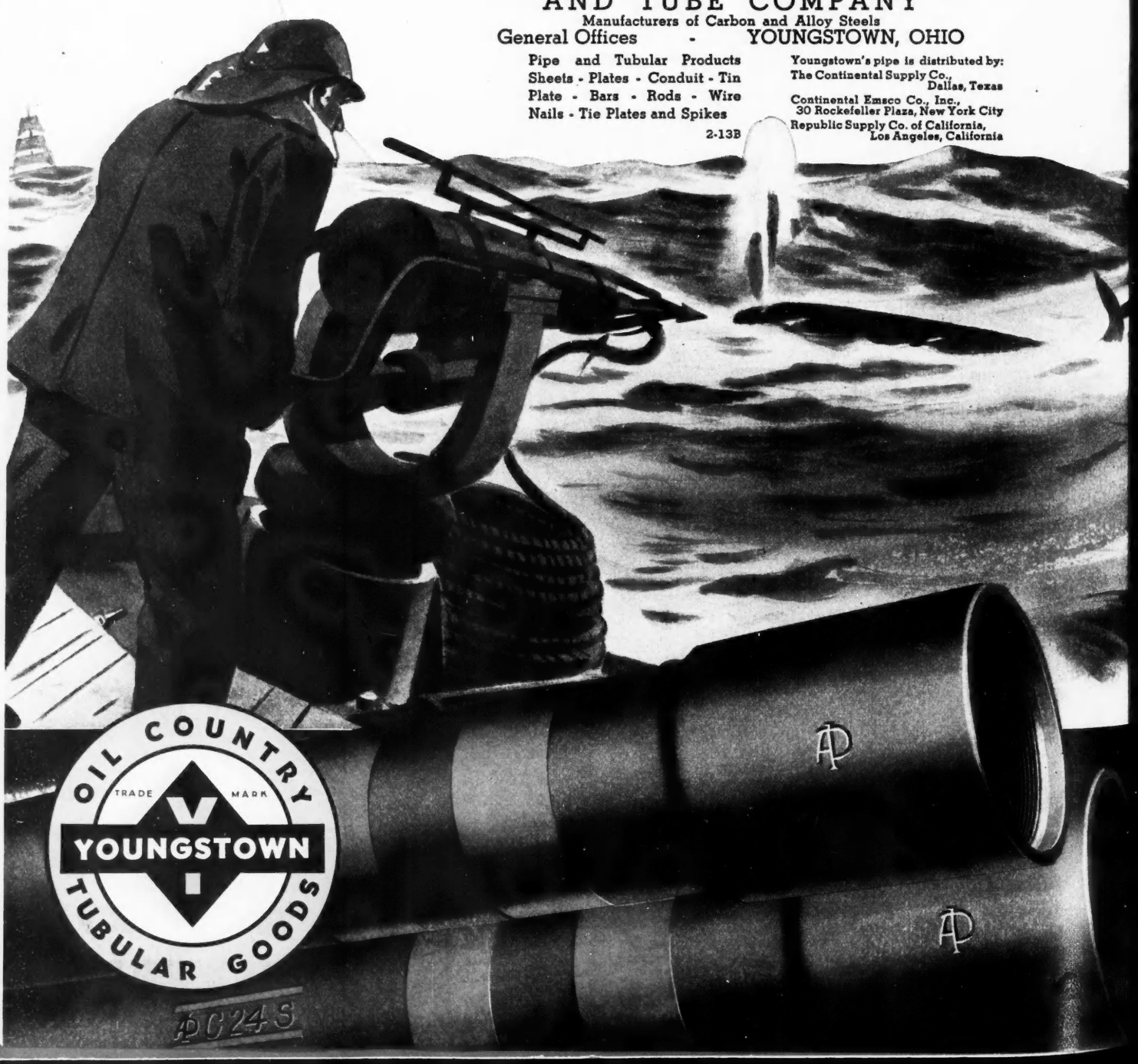
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